

UNCLASSIFIED

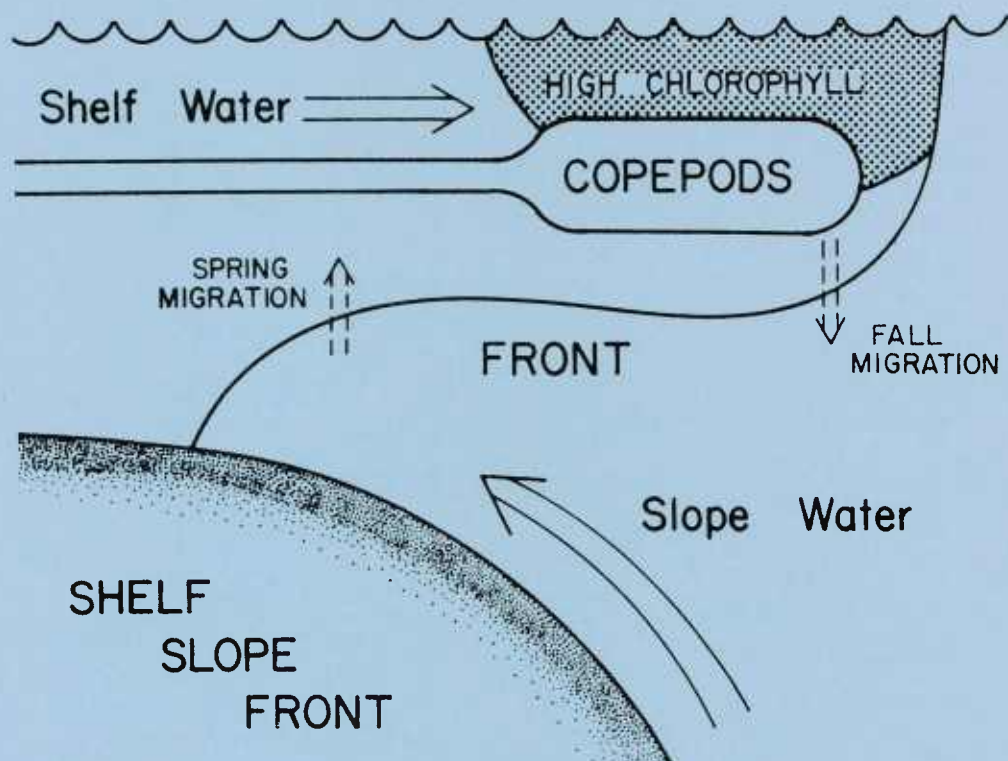
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE																
1a. REPORT SECURITY CLASSIFICATION <b>Unclassified</b>		1b. RESTRICTIVE MARKINGS <b>None</b>														
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT  <b>Approved for public release; distribution is unlimited.</b>														
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE																
4. PERFORMING ORGANIZATION REPORT NUMBER(S)  <b>NORDA Technical Note 303</b>		5. MONITORING ORGANIZATION REPORT NUMBER(S)  <b>NORDA Technical Note 303</b>														
6. NAME OF PERFORMING ORGANIZATION  <b>Naval Ocean Research and Development Activity</b>		7a. NAME OF MONITORING ORGANIZATION  <b>Naval Ocean Research and Development Activity</b>														
6c. ADDRESS (City, State, and ZIP Code)  <b>Ocean Science Directorate NSTL, Mississippi 39529-5004</b>		7b. ADDRESS (City, State, and ZIP Code)  <b>Ocean Science Directorate NSTL, Mississippi 39529-5004</b>														
8a. NAME OF FUNDING/SPONSORING ORGANIZATION  <b>Naval Ocean Research and Development Activity</b>	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER														
8c. ADDRESS (City, State, and ZIP Code)  <b>Ocean Science Directorate NSTL, Mississippi 39529-5004</b>		10. SOURCE OF FUNDING NOS. <table border="1"><tr><td>PROGRAM ELEMENT NO. <b>61153N</b></td><td>PROJECT NO.</td><td>TASK NO.</td><td>WORK UNIT NO.</td></tr></table>			PROGRAM ELEMENT NO. <b>61153N</b>	PROJECT NO.	TASK NO.	WORK UNIT NO.								
PROGRAM ELEMENT NO. <b>61153N</b>	PROJECT NO.	TASK NO.	WORK UNIT NO.													
11. TITLE (Include Security Classification) <b>Bibliography of Research on Ocean Fronts, 1964-1984</b>																
12. PERSONAL AUTHOR(S) <b>Laura B. Gilham, Joseph J. Mika, and Denis A. Wiesenburg</b>																
13a. TYPE OF REPORT  <b>Final</b>	13b. TIME COVERED From _____ To _____	14. DATE OF REPORT (Yr., Mo., Day)  <b>August 1985</b>		15. PAGE COUNT  <b>56</b>												
16. SUPPLEMENTARY NOTATION																
17. COSATI CODES <table border="1"><thead><tr><th>FIELD</th><th>GROUP</th><th>SUB. GR.</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table>		FIELD	GROUP	SUB. GR.										18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)  <b>ocean fronts, remote sensing, dynamic chemical processes</b>		
FIELD	GROUP	SUB. GR.														
19. ABSTRACT (Continue on reverse if necessary and identify by block number)  <p>This report contains a bibliography of published papers describing research related to oceanic fronts. The citations cover research on physical, chemical and biological oceanographic studies of ocean fronts and also observations made by remote sensing. The papers listed cover the period from 1964 to 1984. A few earlier papers, considered classics, are also included. This bibliography was assembled by the School of Library Service of the University of Southern Mississippi as the first step in a program by the Naval Ocean Research and Development Activity to study the dynamic chemical processes associated with ocean frontal boundaries. Over 750 citations are included. The methods employed in obtaining and screening papers for inclusion in the bibliography are described.</p>																
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT  UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input checked="" type="checkbox"/> DTIC USERS <input type="checkbox"/>		21. ABSTRACT SECURITY CLASSIFICATION  <b>Unclassified</b>														
22a. NAME OF RESPONSIBLE INDIVIDUAL  <b>Denis A. Wiesenburg</b>		22b. TELEPHONE NUMBER (Include Area Code)  <b>(601) 688-5491</b>		22c. OFFICE SYMBOL  <b>Code 333</b>												

Naval Ocean Research and  
Development Activity  
NSTL, Mississippi 39529



## Bibliography of Research on Ocean Fronts, 1964-1984



Approved for Public Release  
Distribution Unlimited

Laura B. Gilham  
Joseph J. Mika  
School of Library Service  
University of Southern Mississippi

Denis A. Wiesenbureg  
Ocean Science Directorate  
Oceanography Division

July 1985

## ABSTRACT

This report contains a bibliography of published papers describing research related to oceanic fronts. The citations cover research on physical, chemical and biological oceanographic studies of ocean fronts and also observations made by remote sensing. The papers listed cover the period from 1964 to 1984. A few earlier papers, considered classics, are also included. This bibliography was assembled by the School of Library Service of the University of Southern Mississippi as the first step in a program by the Naval Ocean Research and Development Activity to study the dynamic chemical processes associated with ocean frontal boundaries. Over 750 citations are included. The methods employed in obtaining and screening papers for inclusion in the bibliography are described.

## TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS . . . . .	iii
INTRODUCTION . . . . .	1
SOURCES OF INFORMATION . . . . .	1
REFERENCES . . . . .	3
BIBLIOGRAPHICAL CITATIONS ON OCEAN FRONTS . . . . .	4

## ACKNOWLEDGEMENTS

We would like to thank the authors who provided us with reprints and related information, and NASA Librarian Marilyn Umfress and NAVOCEANO Librarian Ann Loomis for their assistance in guiding us through the data base searches. NAVOCEANO Library Technician Dianne Sellier provided endless help with our numerous interlibrary loan requests. Special thanks goes to Ms. Mary Wade who typed the bibliography and made the initial corrections and to Ms. Janet H. Watkins who made the final corrections and revisions. This work was funded by the Naval Ocean Research and Development Activity (program element 61153N, Herbert Eppert, Jr., program manager) through office of Naval Research Contract No. N00014-84-G-0121 to the University of Southern Mississippi.

## BIBLIOGRAPHY OF RESEARCH ON OCEANIC FRONTS, 1964-1984

### INTRODUCTION

Ocean fronts can be defined as oceanic areas where horizontal gradients of various measurable parameters are intense. These areas are generally boundaries between different water masses which exhibit notable differences in temperature, salinity, chlorophyll and other properties. One example of an ocean front is the shelf-slope front off the eastern coast of the United States which separates the cold, fresher, nutrient-rich shelf water from the warmer, saltier slope water. The Gulf Stream boundary is an example of another type of ocean front, a current boundary front.

Fronts are located throughout the world's oceans. Figure 1 is a map showing the locations of the various frontal boundaries as compiled by the Naval Oceanographic Office. Fronts are areas of high interest to oceanographers because they represent regions of strong anomalies in the ocean. Acoustic propagation changes significantly at frontal boundaries and thus makes a knowledge of frontal locations and processes important to naval fleet operations. Fronts also represent areas of high biological activity that are often productive fishing grounds which can be commercially exploited. Chemists are interested in ocean frontal boundaries since they represent oceanic interfaces where chemical processes are very dynamic.

In 1984 the Naval Ocean Research and Development Activity (NORDA) initiated a program to study the interactions of chemical, biological, and physical processes at oceanic fronts. This program is called Chemical Dynamics in Ocean Frontal Areas. In initiating this program, NORDA contracted the School of Library Service of the University of Southern Mississippi to undertake a literature search to identify the published research articles and reports dealing with studies of ocean fronts and frontal processes. This document is the result of that work. It gives the complete citation for all papers on ocean fronts published between January 1964 and July 1984. The manner in which the search was performed is detailed. NORDA plans to update this document periodically. Authors cited or others who are interested in studies of ocean fronts are requested to send corrections and additions for the next revision to Dr. Denis A. Wiesenburg, NORDA Code 333, NSTL, Mississippi 39529, telephone (601) 688-5491.

### SOURCES OF INFORMATION

The core for the bibliography was formed from a database search executed through Oceanic Abstracts which provided over 400 citations. The terms used in the original search were truncated versions of the following:

front; frontal boundaries; frontal zone; and not beach.

This search was later enhanced by adding the following search terms:

tropical convergence; subtropical convergence; midtasman convergence; antarctic convergence and antarctic divergence.

The search term "siome" was tried, but produced no hits. Periodically, the search was re-executed to retrieve new additions to the database. The last Oceanic Abstracts search was executed in July 1984.



## MEAN POSITIONS OF OCEANIC FRONTS

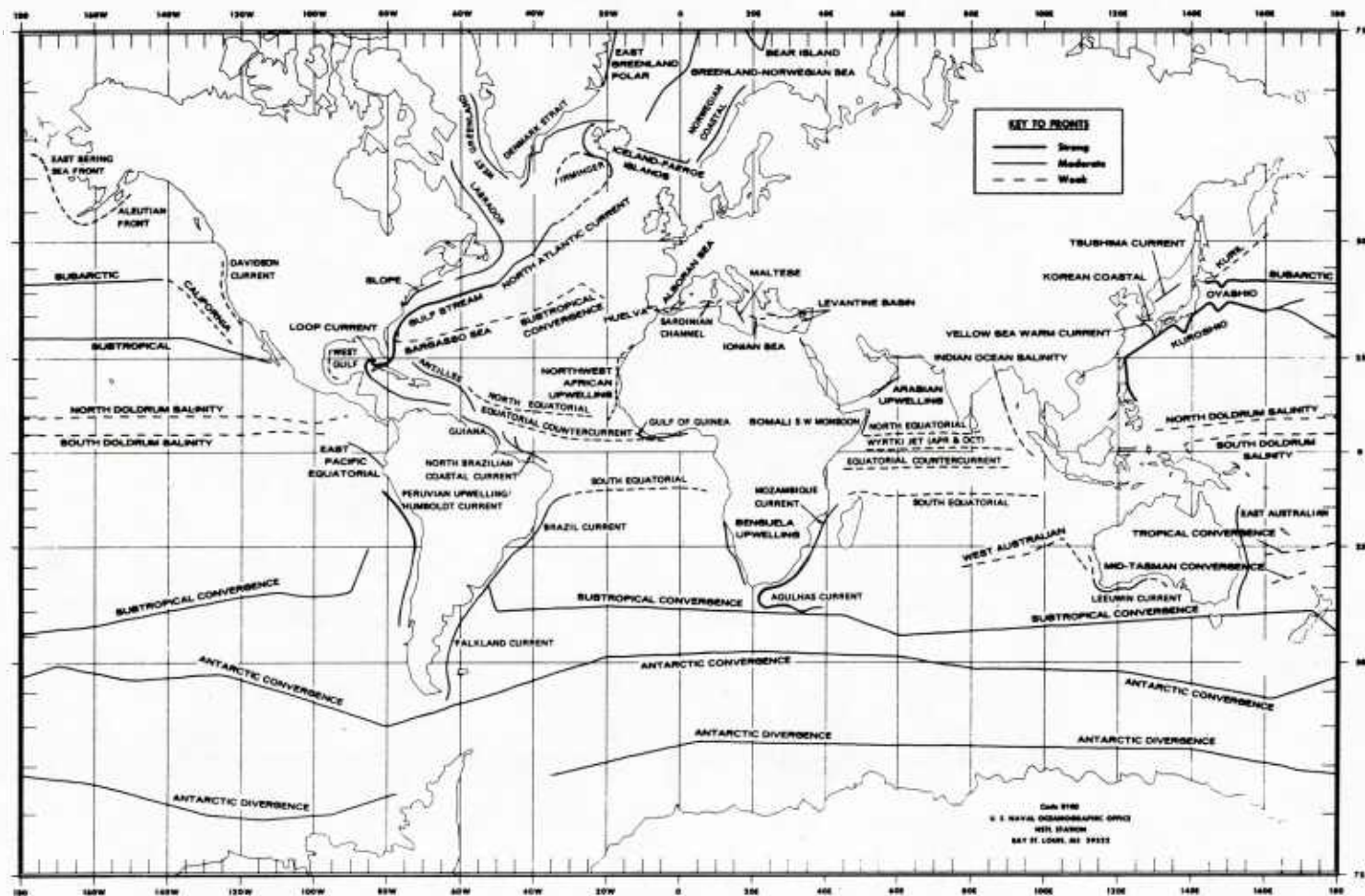


Figure 1. Location of major oceanic fronts as compiled by the U.S. Naval Oceanographic Office.

Similar searches were executed through the Chemical Abstracts and Biosis databases providing further citations. An additional database search in Science Citation Index was executed, using the names of several of the more prolific authors on the subject of ocean fronts. This provided yet another source for citations. Current issues of several major oceanographic journals were also scanned for the most recent articles, not yet incorporated in the computer databases. Some of those journals were Deep-Sea Research, Journal of Physical Oceanography, Journal of Geophysical Research, Limnology and Oceanography, and Biological Oceanography. For most of the articles included, the author was contacted for a reprint. In the process of requesting reprints from authors, additional pertinent references were received and added.

Several more citations were discovered in an unpublished bibliography on ocean fronts which had been compiled by Dr. C.N.K. Mooers of the Naval Postgraduate School. All papers from M.J. Bowman and W.E. Esaias's (1978) book, "Ocean Fronts in Coastal Processes" were included along with the papers in the Royal Society of London's Circulation and Fronts in Continental Shelf Seas (Royal Society of London, 1981). Pertinent papers from the Chapman Conference on Oceanic Fronts, Oct. 11-14, 1977 in New Orleans (Csanady, 1978) were also included.

Papers on the following subjects were excluded from the bibliography: atmospheric fronts and frontogenesis; effect of atmospheric fronts on waves, etc.; beach fronts; wave fronts; and reef fronts. Although several papers mention eddies and rings, no special effort was made to include papers dealing with these subjects; however, they were not excluded when discovered.

All citations are ordered alphabetically by primary author's name and then by succeeding author and date. Citations of foreign language journals and reports list the English language source if it was available. Citations are given in the format of the journal Limnology and Oceanography. All abbreviations follow the guidelines established by the American National Standards Institute, Standards Committee Z39 (American National Standards Institute, 1971).

#### REFERENCES

- American National Standards Institute. 1971. Word Abbreviation List, 1971 Edition, National Clearinghouse for Periodical Title Word Abbreviations, Chemical Abstracts Service, Columbus, Ohio. 42 p.
- Bowman, M.J. and W.E. Esaias. 1978. Oceanic Fronts in Coastal Processes. Springer-Verlag.
- Csanady, G.T. [ed.]. 1978. Chapman Conference on Oceanic Fronts: Papers. Oct. 11-14, 1977, New Orleans. J. Geophys. Res. 83 (C9).
- Royal Society of London. 1981. Circulation and Fronts in Continental Shelf Seas. Cambridge Univ. Press.



# BIBLIOGRAPHICAL CITATIONS ON OCEAN FRONTS

- Abramov, A.A., B.A. Tareyev and V.I. Ul'yanova. 1972. Baroclinic instability in Kochin's two-layer model of a frontal wave on the beta plane. *Izv., Atmos. Oceanic Phys.* 8: 131-141.
- Abramov, R.V. 1968. Divergence of the wind field over the North Atlantic. *Oceanology* 7: 461-467.
- Ainley, D.G. and S.S. Jacobs. 1981. Sea-bird affinities for ocean and ice boundaries in the Antarctic. *Deep-Sea Res.* 28A: 1173-1185.
- Aitsam, A.M. 1981. Hydrodynamics as a limiting factor in the development of the Baltic Sea, p. 165-189. In J.C.J. Nihoul [ed.], *Ecohydrodynamics. Proc. 12th Int. Liege Colloq. on Ocean Hydrodyn.* Elsevier. *Oceanogr. Ser.* 32.
- Akamatsu, H. 1974. On the oceanographic structure at the frontal zone in the Japan Sea: (1) Some measurements of horizontal divergence. *Umi To Sora* 50: 123-136.
- Allan, T.D. and E. Ozturgut. 1975. Investigations of the oceanic frontal system east of Malta, p. 1-22. In W.R. Danielson [ed.], *Proc. 3rd S/T/D Conf. and Workshop. Plessey Environ. Syst.*
- Allanson, B.R., R.C. Hart and J.R.E. Lutjeharms. 1981. Observations on the nutrients chlorophyll and primary production of the Southern Ocean south of Africa. *S. Afr. J. Antarct. Res.* No. 10-11: 3-14.
- Allanson, B.R. and L. Parker. 1983. Frontal zones, chlorophyll and primary production patterns in the surface waters of the Southern Ocean south of Cape Town. *Abstr. p. D IV. 5th Natl. Oceanogr. Symp. Rhodes Univ., Grahamstown.*
- Allen, C.M., J.H. Simpson and R.M. Carson. 1979. Structure and variability of fronts in the Irish Sea as observed by an undulating CTD system. *Geophys. J. R. Astron. Soc.* 57: 286.
- Allen, C.M., J.H. Simpson and R.M. Carson. 1980. The structure and variability of shelf sea fronts as observed by an undulating CTD system. *Oceanol. Acta* 3: 59-68.
- Allen, J.S. and R.L. Smith. 1981. On the dynamics of wind-driven shelf currents. *Phil. Trans. R. Soc. Lond.* A302: 617-634.
- Amos, A.F., M.G. Langseth and R.G. Markl. 1972. Visible oceanic saline fronts, p. 49-62. In A.L. Gordon [ed.], *Studies in physical oceanography: A tribute to George Wust on his 80th birthday.* Gordon and Breach Science Pub., New York.
- Anati, D.A. 1970. On the mechanism of the deep mixed layer formation during MEDOC 1969. *Cahiers Oceanogr.* XXII: 427-442.
- Anderson, F.E. 1980. The variation in suspended sediment and water properties in the flood-water front traversing the tidal flat. *Estuaries* 3: 28-37.
- Andrews, J.C., M.W. Lawrence and C.S. Nilsson. 1980. Observations of the Tasman Front. *J. Phys. Oceanogr.* 10: 1854-1869.

- Andrews, W.R.H. and L. Hutchings. 1980. Upwelling in the southern Benguela Current South Africa. *Prog. Oceanogr.* 9: 1-81.
- Angell, G.G. and L.E. Webb. 1982. Oceanographic analysis manual for ICAPS users. Ref. Publ. U.S. Nav. Oceanogr. Off. NTIS Order No.: AD-A122 691/9.
- Armstrong, R.S. 1983. Variation in the shelf water front position in 1982 from Georges Bank to Cape Romain. Sci. Counc. Meet., June 1983. Northwest Atl. Fish. Organ. Serial No. N660. NAFO SCR Doc. 83/VI/12.
- Armstrong, R.S. 1984. Variation in the shelf water front position in 1983 from Georges Bank to Cape Romain. Sci. Counc. Meet., June 1984. Northwest Atl. Fish. Organ. Serial No. N790. NAFO SCR Doc. 84/VI/17.
- Arnone, R.A. 1985. Optical variability and biological activity across the Alboran Front as monitored by CZCS. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Artem'yev, V.Ye. 1976. Relation between the distribution of dissolved organic carbon and water dynamics. *Oceanology* 15: 186-188.
- Arthur, R.S. 1965. On the calculation of vertical motion in eastern boundary currents from determinations of horizontal motion. *J. Geophys. Res.* 70: 2799-2803.
- Atkinson, L.P. and B.H. Jones. 1985. Short term variations in chemical and biological properties in an upwelling front off Pt. Conception, California (OPUS II). In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Atkinson, L.P., G.A. Paffenhofer and W.M. Dunstan. 1975. Hydrographic and biological observations at an anchor station off St. Augustine, Florida. 9-14 April 1975 (Eastward Cruise E-1G-75). Georgia Mar. Sci. Cent., Univ. Syst. Georgia, Tech. Rep. Ser. No. 77-4.
- Atkinson, L.P. and T.E. Targett. 1983. Upwelling along the 60-m isobath from Cape Canaveral to Cape Hatteras and its relationship to fish distribution. *Deep-Sea Res.* 30: 221-226.
- Backus, R.H., J.E. Craddock, R.L. Haedrick and D.L. Shores. 1969. Mesopelagic fishes and thermal fronts in the western Sargasso Sea. *Mar. Bio.* 3: 87-106.
- Bane, J.M., Jr. 1980. Coastal-trapped and frontal-trapped waves in a baroclinic western boundary current. *J. Phys. Oceanogr.* 10: 1652-1668.
- Bane, J.M., Jr., D.A. Brooks and K.R. Lorenson. 1981. Synoptic observations of the three-dimensional structure and propagation of Gulf Stream meanders along the Carolina continental margin. *J. Geophys. Res.* 86: 6411-6425.
- Bane, J.M., Jr. and Y. Hsueh. 1980. On the theory of coastal-trapped waves in an upwelling frontal zone. *J. Phys. Oceanogr.* 10: 270-285.

- Bang, N.D. 1970. Dynamic interpretations of a detailed surface temperature chart of the Agulhas Current retroflexion and fragmentation area. *S. Afr. Geogr. J.* 52: 67-76.
- Bang, N.D. 1970. Major eddies and frontal structures in the Agulhas Current retroflexion area in March, 1969. [unpaged]. In *Oceanogr. in S. Afr.* 1970. Symp. Pap.
- Bang, N.D. 1973. Characteristics of an intense ocean frontal system in the upwell regime west of Cape Town. *Tellus* 25: 256-265.
- Bang, N.D. and W.H. Andrews. 1974. Direct current measurements of a shelf-edge frontal jet in the southern Benguela system. *J. Mar. Res.* 32: 405-417.
- Baranov, Ye.I. 1966. Short-period fluctuations of the Gulf Stream front during the winter-spring season of 1963. *Oceanology* 6: 185-188.
- Baranov, Ye.I. 1967. Study of eddies in the frontal zones in the Gulf Stream. *Oceanology* 7: 61-65.
- Baranov, Ye.I. 1972. Average monthly positions of ocean fronts in the North Atlantic. *Oceanology* 12: 187-193.
- Baranov, Ye.I. and M.A. Shmatko. 1966. An investigation of thermal structure in the frontal zone of the Gulf Stream. *Oceanology* 6: 630-634.
- Barkley, R.A. 1970. The Kuroshio-Oyashio Front: A system of near-stationary vortices, p. 31-35. In J.C. Marr [ed.], *The Kuroshio: A symposium on the Japan current*. East-West Center Pr.
- Barnard, W.R., M.O. Andreae and R.L. Iverson. 1985. *Phaeocystis pouchetti* and the production of dimethylsulfide in the southeast Bering Sea. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Barton, E.D., P. Hughes and J.H. Simpson. 1982. Vertical shear observed at contrasting sites over the continental-slope off NW Africa. *Oceanol. Acta.* 5: 169-178.
- Beardall, J., P. Foster, D. Voltolina and G. Savidge. 1982. Observations on the surface water characteristics in the western Irish Sea: July 1977. *Estuarine Coastal Shelf Sci.* 14: 589-598.
- Beardsley, R.C., W.C. Boicourt and D.V. Hansen. 1976. Physical oceanography of the Middle Atlantic Bight. *Limnol. Oceanog. Spec. Symp.* 2: 20-34.
- Beardsley, R.C. and C.N. Flagg. 1976. The water structure, mean currents, and shelf-water/slope-water front on the New England continental shelf. *Mem. Soc. R. Sci. Liege.* 6th Ser. X: 209-225.
- Beckerle, J.C. 1972. Prediction of mid-oceanic frontal passage confirmed in near-surface current measurements. *J. Geophys. Res.* 77: 1637-1646.

- Beers, J.R., M.R. Stevenson, R.W. Eppley and E.R. Brooks. 1971. Plankton populations and upwelling off the coast of Peru--June 1969. *Fish Bull.* 69: 859-877.
- Belevich, R.R. 1972. Subantarctic (Polar) front in the Southern Ocean. *Oceanology* 12: 618-620.
- Belyayev, V.S. and Yu.V. Nozdrin. 1979. Vertical spectra of the temperature field fine structure in a frontal zone. *Oceanology* 19: 367-372.
- Bennett, A.S. 1979. Temperature-salinity-density structure near the Scotian shelf-break observed with a batfish, p. 39. In 13th Annu. Congr. Can. Meteorol. Oceanogr. Soc.: Abstr. pap.
- Berger, W.H. 1971. Planktonic foraminifera sediment production in an oceanic front. *J. Foraminiferal Res.* 1: 95-118.
- Bernstein, R.L., L. Breaker and R. Whritner. 1977. California current eddy formation: Ship, air and satellite results. *Science* 195: 353-359.
- Betzer, P.R., C.S. Lewis, J.G. Acker, R.H. Byrne and R.A. Feely. 1985. Aragonite and calcite fluxes in the Kuroshio Current and adjacent waters along 165 east. In Wiesenburg, D.A. and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Bigelow, H.B. 1933. Studies of the waters on the continental shelf, Cape Cod to Chesapeake Bay I, the cycle of temperature. *Mass. Inst. Technol. Woods Hole Oceanogr. Inst. Pap. Phys. Oceanogr. Meteorol.* 2: 4.
- Bigelow, H.B. and M. Sears. 1935. Studies of the waters on the continental shelf, Cape Cod to Chesapeake Bay II, salinity. *Mass. Inst. Technol. Woods Hole Oceanogr. Inst. Pap. Phys. Oceanogr. Meteorol.* 4: 1.
- Bisagni, J.J. 1983. Lagrangian current measurements within the eastern margin of a warm-core Gulf Stream ring. *J. Phys. Oceanogr.* 13: 709-715.
- Blanton, J.O. 1981. Ocean currents along a nearshore frontal zone on the continental shelf of the southeastern United States. *J. Phys. Oceanogr.* 11: 1627-1637.
- Blanton, J.O. and L.P. Atkinson. 1983. Transport and fate of river discharge on the continental shelf of the southeastern United States. *J. Geophys. Res.* 88: 4730-4738.
- Blanton, J.O. and J.G. Pattullo. 1969. The subsurface front beneath the subtropical convergence in the northeast Pacific Ocean. Abstr., EOS, Trans. Geophys. Union. 50: 194.
- Blanton, J.O., J.A. Yoder and F.B. Schwing. 1985. Scales of chlorophyll-a variations in a frontal zone off the Georgia coast. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.



- Bleck, R. 1973. Numerical forecasting experiments based on the conservation of potential vorticity on isentropic surfaces. *J. Appl. Met.* 12: 737-752.
- Bleck, R. 1978. Simulation of coastal upwelling frontogenesis with an isopycnic coordinate model. *J. Geophys. Res.* 83: 6163-6172.
- Bogdanov, M.A., S.G. Oradovsky, Ye.V. Solyankin and N.V. Khvatskiy. 1969. On the frontal zone of the Scotia Sea. *Oceanology* 9: 777-783.
- Boland, F.M. and J.A. Church. 1981. The East Australian Current 1978. *Deep-Sea Res.* 28: 937-957.
- Boltovskoy, D. 1978. Biogeography of the Southwestern Atlantic: Plankton. *Physics, Secc. A, Buenos Aires* 38: 67-90.
- Boltovskoy, D. 1979. Zooplankton of the South-western Atlantic. *S. Afr. J. Sci.* 75: 541-544.
- Bosart, L.F., C.J. Vando and J.M. Helsdon. 1972. Coastal frontogenesis. *J. Appl. Met.* 11: 1236-1258.
- Bottazi, E.M. and M.G. Andreoli. 1982. Distribution of Acantharia in the western Sargasso Sea Atlantic Ocean in correspondence with thermal fronts. *J. Protozool.* 29: 162-196.
- Bourke, R.H. and J.F. Pfeiffer. 1978. Evidence of subarctic water mass intrusions at ocean weather station November. *J. Geophys. Res.* 83: 4561-4566.
- Bowden, K.F. 1978. Occurrence of a seasonal pycnocline in coastal waters. [unpubl.].
- Bowden, K.F. 1981. Summing-up. *Phil. Trans. R. Soc. Lond.* A302: 683-689.
- Bowman, M.J. and W.E. Esaias. 1977. Coastal jets, fronts, and phytoplankton patchiness, p. 255-268. In J.C.J. Nihoul [ed.], *Bottom turbulence*. Proc. 8th Int. Liege Colloq. on Ocean Hydrodyn. Elsevier. Oceanogr. Ser. 19.
- Bowman, M.J. and W.E. Esaias. 1978. *Oceanic fronts in coastal processes*. Springer-Verlag.
- Bowman, M.J. and W.E. Esaias. 1981. Fronts, stratification, and mixing in Long Island and Block Island Sounds. *J. Geophys. Res.* 86: 4260-4264.
- Bowman, M.J., W.E. Esaias and M.B. Schnitzer. 1981. Tidal stirring and the distribution of phytoplankton in Long Island and Block Island Sounds. *J. Mar. Res.* 39: 587-603.
- Bowman, M.J. and R.L. Iverson. 1977. Estuarine and plume fronts, p. 87-104. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes*. Springer-Verlag.
- Bowman, M.J., A.C. Kibblewhite, S.M. Chiswell and R.A. Murtagh. 1983. Shelf fronts and tidal stirring in Greater Cook Strait, New Zealand. *Oceanol. Acta* 6: 119-129.



- Bowman, M.J., A.C. Kibblewhite, R.A. Murtagh, S.M. Chiswell, and B.G. Sanderson. 1983. Circulation and mixing in Greater Cook Strait, New-Zealand. *Oceanol. Acta* 6: 383-391.
- Bowman, M.J., P.P. Lapennas and R.A. Murtagh. 1983. Tidal mixing, fronts and summer plankton production in Greater Cook Strait. *Estuaries* 6: 323-324.
- Bowman, M.J. and A. Okubo. 1977. Cross frontal mixing at Middle-Atlantic Bight shelf-slope front. *EOS, Trans. Am. Geophys. Union* 58: 888.
- Bowman, M.J. and A. Okubo. 1978. Cabbeling at thermohaline fronts. *J. Geophys. Res.* 83: 6173-6178.
- Boyd, J.P. 1980. The nonlinear equatorial Kelvin Wave. *J. Phys. Oceanogr.* 10: 1-11.
- Bratnick, M. 1970. Convolutions of the surface outcrop of the northern edge of the Gulf Stream. *Jt. Ocean. Assy. 15th Gen. Assy., Tokyo.*
- Briscoe, M.G. 1972. Supplementary temperature data from the Maltese oceanic frontal studies. *SACLANTCEN Intern. Note* 324.
- Briscoe, M.G., O.M. Johannessen and S. Vincenzi. 1974. Maltese oceanic front: A surface description by ship and aircraft. *Deep-Sea Res.* 21: 247-262.
- Broecker, W.S. and G.H. Oestlund. 1979. Property distributions along the sigma theta = 26.8 isopycnal in the Atlantic Ocean. *J. Geophys. Res.* 84: 1145-1154.
- Broecker, W.S., T. Takahashi and M. Stuiver. 1980. Hydrography of the central Atlantic--II Waters beneath the two-degree discontinuity. *Deep-Sea Res.* 27: 397-419.
- Bronsink, S.H. 1980. Microplanktonic ATP-biomass and GTP-productivity associated with upwelling off Pt. Sur, California. *Nav. Postgrad. Sch. Monterey, Calif. AD# A093585.*
- Brooks, D.A. and C.N.K. Mooers. 1977. Free, stable continental-shelf waves in a sheared, barotropic boundary current. *J. Phys. Oceanogr.* 7: 380-388.
- Brooks, J.M., D.F. Reid and R.A. Lamontagne. 1985. Reduced gas geochemistry at ocean frontal areas. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.*
- Brown, M.F. and D.R. Kester. 1985. Distribution of nutrients in warm core Gulf Stream rings. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.*
- Brown, O.B., D.B. Olson, J.W. Brown and R.H. Evans. 1983. Satellite infrared observation of the kinematics of a warm-core ring. *Aust. J. Mar. Freshw. Res.* 34: 535-545.

- Brown, R.G.B. 1979. Sea birds of the Senegal upwelling and adjacent waters. *Ibis*, J. Brit. Ornithol. Union 121: 283-292.
- Bryantsev, V.A., S.V. Pavlukhin and A.S. Pelevin. 1979. Characteristics of geostrophic currents and the subtropical convergence zone in the southwestern Indian Ocean. *Oceanology* 19: 395-399.
- Bubnov, V.A. and A.N. Kosarev. 1964. Distribution of water masses in the Atlantic Ocean on a profile along the 30W meridian. *Sov. Oceanogr.* No. 2: Ser. 54-62.
- Buchwald, V.T. and R.A. de Szoeke. 1973. The response of a continental shelf to travelling [sic] pressure disturbances. *Aust. J. Mar. Fresh. Res.* 24: 143-158.
- Bulgakov, N.P. 1966. The effect of the initial conditions on transformation of some characteristic surfaces in the vertical mixing of water masses. *Oceanology* 6: 622-630.
- Bulgakov, N.P. 1971. Thermohaline structure of the sub-arctic front in the northwest Pacific Ocean. *Oceanology* 11: 316-324.
- Burkov, V.A. 1966. Structure of Pacific Ocean currents and their nomenclature. *Oceanology* 6: 1-11.
- Burkov, V.A. and Yu.V. Pavlova. 1979. Seasonal and synoptic variability of the surface temperature field in the northwestern Pacific Ocean east of Japan. *Oceanology* 19: 245-249.
- Buzdalin, Y.I. and A.A. Elizarov. 1963. Hydrological conditions in the Newfoundland banks and Labrador areas in 1960, p. 152-168. In Y.Y. Marti [ed.], *Soviet fisheries investigations in the northwest Atlantic*.
- Bye, J.A.T. 1979. A one-dimensional model of meridional oceanic heat transport. *J. Mar. Res.* 37: 493-514.
- Byshev, V.I. 1976. Investigation of the mesostructure of the velocity field in the North Pacific Current. *Oceanology* 16: 121-124.
- Camerlengo, A.L. 1982. Large-scale response of the Pacific Ocean subarctic front to momentum transfer: A numerical study. *J. Phys. Oceanogr.* 12: 1106-1121.
- Camerlengo, A.L. 1981. On the dynamical response of the Subarctic front to momentum transfer. *Diss. Abst. Int., Pt. B* 42: No. 1.
- Caraux, D. and R.W. Austin. 1983. Delineation of seasonal changes of chlorophyll frontal boundaries in Mediterranean coastal waters with Nimbus-7 Coastal Zone Color Scanner data. *Remote Sen. Environ.* 13: 239-249.
- Cavanie, A.G. 1971. Modele non lineaire et non hydrostatique applique a l'etude des fronts internes dans le Detroit de Gibraltar. *Cah. Oceanogr.* 23: 611-627.
- Cavanie, A.G. 1972. Observations de fronts internes dans le Detroit de Gibraltar pendant la campagne oceanographique OTAN 1970 et interpretation des resultats par un modele mathematique. *Soc. R. Sci. Liege Mem.* 2: 27-41.

- Cavanie, A. 1972. On the propagation and the evolution of internal fronts in the straits of Gibraltar, p. 94-98. In International Council for the Exploration of the Sea. Charlottenlund Slot, Den. Rapp. P-V Reun., 162.
- Charney, J. 1971. Tropical cyclogenesis and formation of the intertropical convergence zone, p. 355-368. In W.H. Reid [ed.], Mathematical problems in the geophysical sciences, 1. Geophysical fluid dynamics. Lectures in applied mathematics, v. 13. Am. Math. Soc., Providence, R.I.
- Chen, C. 1985. The Bering and Weddell Seas' ice-edge zones in winter. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Chen, C. 1968. The distribution of thecosomatous pteropods in relation to the Antarctic Convergence. Antarct. J. U.S. 3: 155-157.
- Cheney, R.E. 1977. Synoptic observations of the oceanic frontal system east of Japan. J. Geophys. Res. 82: 5459-5468.
- Cheney, R.E. 1978. Recent observations of the Alboran Sea frontal system. J. Geophys. Res. 83: 4593-4597.
- Cheney, R.E. and R.A. Doblar. 1982. Structure and variability of the Alboran Sea frontal system. J. Geophys. Res. 87: 585-594.
- Christensen, L.K. and C. Christiansen. 1983. Infra-red line-scanning and field measurements of temperature fronts in thermal discharge. Vatten 39: 388-399.
- Christiansen, C. and H.K. Nielsen. 1980. Effect of cooling water on bottom temperatures in a shallow embayment I. Preliminary results. Vatten 36: 144-153.
- Church, T.M., C.N.K. Mooers and A.D. Voorhis. 1984. Exchange processes over a middle Atlantic bight shelfbreak canyon. Estuarine, Coastal Shelf Sci. In press.
- Clark, J.R. and P.E. LaViolette. 1981. Detecting the movement of oceanic fronts using registered Tiros-N imagery. Geophys. Res. Lett. 8: 229-232.
- Clarke, L.C. and T. Laevastu. 1967. Numerical methods for synoptic computation of oceanic fronts and water type boundaries. Int. J. Oceanol. Limnol. 1: 28-45.
- Clarke, L.C. and R. J. Renard. 1966. The U.S. Navy numerical frontal analysis scheme: Further development and a limited evaluation. J. Appl. Met. 5: 764-777.
- Cline, J.D. and H. Curl, Jr. 1985. Horizontal transport along the north Aleutian Shelf as determined from the distribution of dissolved methane. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean. Res. and Dev. Act. NSTL, Miss.
- Coachman, L.K. 1982. Flow convergence over a broad, flat continental shelf. Cont. Shelf Res. 1: 1-14.

- Coachman, L.K. and R.L. Charnell. 1979. On lateral water mass interaction - a case study, Bristol Bay, Alaska. *J. Phys. Oceanogr.* 9: 278-297.
- Codispoti, L.A., G.E. Friederich and P.J. Kelly. 1985. Fronts in relation to chemical variability in the Peruvian upwelling region. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Collins, C.A., C.N.K. Mooers, M.R. Stevenson, R.L. Smith and J.G. Pattullo. 1968. Direct current measurements in the frontal zone of a coastal upwelling region. *J. Oceanogr. Soc. Japan*. 24: 295-306.
- Colton, J.B., Jr. 1975. Further observations on a thermal front in the Sargasso Sea. *Deep-Sea Res.* 22: 433-439.
- Conand, F. and W.J. Richards. 1982. Distribution of tuna larvae between Madagascar and the Equator, Indian Ocean. *Biol. Oceanogr.* 1: 321-336.
- Copin-Montegut, C. and G. Copin-Montegut. 1978. The chemistry of particulate matter from the South Indian and Antarctic Oceans. *Deep-Sea Res.* 25: 911-932.
- Cornelius, C.J. 1974. The inclusion of moisture in a numerical model of steady-state fronts. Master's thesis. U.S. Nav. Postgrad. Sch., Monterey, Calif.
- Cracknell, A.P., F.J. Vernberg and F.P. Diemer [eds.]. 1982. Initial plans for remote sensing of the North Sea using coastal zone colour scanner (CZCS), p. 243-262. In *Processes in marine remote sensing*. Univ. South Carolina Pr.
- Craig, H., Y. Chung and M. Fiadeiro. 1972. A benthic front in the South Pacific. *Earth Planet. Sci. Lett.* 16: 50-65.
- Crease, J. 1965. The Antarctic circumpolar current and convergence. *R. Soc. Lond. Proc. Ser. A*, 281: 14-21.
- Cresswell, G.R., C. Ellyett, R. Legeckis and A.F. Pearce. 1983. Nearshore features of the East Australian current system. *Aust. J. Mar. Freshw. Res.* 34: 105-114.
- Cresswell, G.R., T.J. Golding and F.M. Boland. 1978. A buoy and ship examination of the subtropical convergence south of western Australia. *J. Phys. Oceanogr.* 8: 315-320.
- Creswick, W.S. 1967. Experiments in objective frontal contour analysis. *J. Appl. Met.* 6: 744-781.
- Cromwell, T. and J.L. Reid. 1956. A study of oceanic fronts. *Tellus*. 8: 94-101.
- Csanady, G.T. 1971. On the equilibrium shape of the thermocline in a shore zone. *J. Phys. Oceanogr.* 1: 263-270.
- Csanady, G.T. 1974. Spring thermocline behavior in Lake Ontario during IFYGL. *J. Phys. Oceanogr.* 4: 425-445.



- Csanady, G.T. 1978. Chapman conference on oceanic fronts: Papers. J. Geophys. Res. 83: 4499-4706.
- Csanady, G.T. 1978. Wind effects on surface to bottom fronts. J. Geophys. Res. 83: 4633-4640.
- Csanady, G.T. 1981. Circulation in the coastal ocean. Adv. Geophys. 23: 101-184.
- Csanady, G.T. 1981. Shelf circulation cells. Phil. Trans. R. Soc. Lond. A302: 515-530.
- Csanady, G.T. 1982. Frictional secondary circulation near an upwelled thermocline. Woods Hole Oceanogr. Inst. Tech. Rep. WHOI-82-52.
- Curtin, T.B., W.R. Johnson and C.N.K. Mooers. 1975. Coastal upwelling experiment-II. Univ. of Miami. Sci. Rep. Hydrogr. Data Rep. UM-RSMAS- 75003.
- Curtin, T.B. and C.N.K. Mooers. 1975. Observation and interpretation of a high-frequency internal wave packet and surface slick pattern. J. Geophys. Res. 80: 882-894.
- Curtin, T.B. and C.N.K. Mooers. 1975. Water mass properties and structure in a coastal upwelling frontal zone. J. Mar. Res. (submitted?)
- Cushman-Roisin, B. 1981. Effects of horizontal advection on upper ocean mixing: A case of frontogenesis. J. Phys. Oceanogr. 11: 1345-1356.
- Cushman-Roisin, B. On the maintenance of the subtropical front and its associated countercurrent. J. Phys. Oceanogr. In press.
- D'Amico, A. 1980. Effects of the Gulf Stream on acoustic propagation. Sci. Appl. Inc. McLean, VA. AD# A099406. Rep. No. SAI-81-221-WA.
- Darbyshire, J. 1964. A hydrological investigation of the Agulhas Current area. Deep-Sea Res. 11: 781-815.
- Darbyshire, M. 1966. The surface waters near the coasts of Southern Africa. Deep-Sea Res. Oceanogr. Abstr. 13: 57-81.
- Deacon, G.E.R. 1964. A discussion on the physical and biological changes across the Antarctic convergence. R. Soc. Lond. Proc. Ser. A, 281: 1-6.
- Deacon, G.E.R. 1964. Southern Ocean, p. 292-307. In R. Priestley, R.J. Adie and G. de Q. Robin [eds.], Antarctic research. A review of British scientific achievement in Antarctica.
- Deacon, G.E.R. 1979. The Weddell Gyre. Deep-Sea Res. 26: 981-995.
- Dean, E.K. 1967. Practical applications of continuous sea surface salinity and temperature data, p. 47-59. Trans. 3rd Annu. MTS. Conf. Exhib., San Diego.
- Deardorff, J.W., G.E. Willis and D.K. Lilly. 1969. Laboratory investigation of nonsteady penetrative convection. J. Fluid Mech. 35: 7-31.



- Defant, F. 1959. On hydrodynamic instability caused by an approach of subtropical and polar front jet stream in northern latitudes before the onset of strong cyclogenesis, p. 305-325. In B. Bolin [ed.], The atmosphere and sea in motion. N. Y. Rockefeller Inst. Pr. and Oxf. Univ. Pr.
- Denham, R.N. 1976. The Tasman front. N. Z. J. Mar. Freshw. Res. 10: 15-30.
- Dietrich, G. 1964. Oceanic polar front survey in the North Atlantic, p.291-308. In H. Odishaw [ed.], Research in Geophysics. Vol. 2, Solid earth and interface phenomena. MIT Press, Cambridge, Mass.
- Dooley, H.D. 1981. The role of axially varying vertical mixing along the path of a current in generating phytoplankton production. Phil. Trans. R. Soc. Lond. A 302: 649-660.
- Dufour, P. and J-M. Stretta. 1973. Fronts thermiques et thermohalins dans la region du Cap Lopez (Golfe de Guinee) Juin-Juillet 1972: Phytoplancton, zooplancton, micronecton et peche thoniere. Cent. Rech. Oceanog. O.R.S.T.O.M. Doc. Sci. 4: 99-142.
- Duncan, C.P. 1968. An eddy in the subtropical convergence southwest of South Africa. J. Geophys. Res. 73: 531-534.
- Duplessy, J.C., P.L. Blanc and M.R. Fontugne. 1983. Pliocene-Quaternary: Glacial-interglacial crises. Proc. Jt. Oceanog. Assem. 1982. Gen. Symp. 133-134.
- Dyubyuk (Dubuque), A.F. 1956. On vertical motions near moving fronts. Izv. Akad. Nauk SSSR. Ser. Geofiz. 9.
- Edwards, R.J. and W.J. Emery. 1982. Australasian Southern Ocean frontal structure during summer 1976-77. Aust. J. Mar. Freshw. Res. 33: 3-22.
- Eliassen, A. 1962. On the vertical circulation in frontal zones. Geofys. Publ., Nor. Vidensk. Akad. Oslo 24: 147-160.
- Elliot, R.D. and E.L. Hovind. 1965. Heat, water, and vorticity balance in frontal zones. J. Appl. Meteorol. 4: 196-211.
- Elliott, A.J., D.-P. Wang and D.W. Pritchard. 1978. The circulation near the head of Chesapeake Bay. J. Mar. Res. 36: 643-655.
- Elliott, G.H. and J.A. Elliott. 1970. Laboratory studies on the thermal bar. Proc. 13th Conf. Great Lakes Res. Int. Assoc. Great Lakes Res.: 413-418.
- El-Sayed, S.Z., E.F. Mandelli and Y. Sugimura. 1964. Primary organic production in the Drake Passage and Bransfield Strait, p. 1-11. In M.O. Lee [ed.], Biology of the Antarctic Seas. Natl. Acad. Sci. Natl. Res. Council. Publ. No. 1190. Antarct. Res. Ser. vol. 1.
- Emery, W.J. 1977. Antarctic polar frontal zone from Australia to the Drake Passage. J. Phys. Oceanogr. 7: 811-822.

- Endoh, M. 1977. Double-celled circulation in coastal upwelling. *J. Oceanogr. Soc. Jap.* 33: 30-37.
- Esaias, W.E. and M.J. Bowman. 1978. Bottom turbulence, fronts and distribution of phytoplankton in Long Island Sound. *EOS, Trans.-Am. Geophys. Union.* 59: 492.
- Evans, G.T. and F.J.R. Taylor. 1980. Phytoplankton accumulation in Langmuir cells. *Limnol. Oceanogr.* 25: 840-845.
- Evans, R.H. and O. Brown. 1981. Propagation of thermal fronts in the Somali Current system. *Deep-Sea Res.* 28: 521-527.
- Evseenko, S.A. 1982. Ichthyoplankton of slope and Gulf Stream waters off Nova Scotia in late autumn 1974. *J. Northwest Atl. Fish. Sci.* 3: 127-139.
- Fearnhead, P.G. 1975. On the formation of fronts by tidal mixing around the British Isles. *Deep-Sea Res.* 22: 311-321.
- Fedorov, K.N. 1971. New evidence of the existence of lateral convection in the ocean. *Oceanology* 11: 822-825.
- Fedorov, K.N. 1971. Origin of thin temperature inversions under the homogeneous surface layer of the ocean. *Oceanology* 11: 12-16.
- Fedorov, K.N. 1972. Temperature inversions of the Red and Mediterranean Seas. *Oceanology* 12: 795-803.
- Fedorov, K.N. 1980. Intrusive fine structure in frontal zones and indication of double diffusion, p. 57-63. In J.C.J. Nihoul [ed.], *Marine turbulence. Proc. 11th Int. Liege Colloq. Ocean Hydrodyn.* Elsevier. *Oceanogr. Ser.* 28.
- Fedorov, K.N. 1983. Physical nature and structure of ocean fronts. Book in Russian.
- Fedorov, K.N., V.A. Bubnov, A.I. Ginzburg and V.T. Paka. 1981. On the frontal systems of Gulf-Stream rings. *Def. Mapp. Agency Aerosp. Cent. St. Louis Air Force Stn. Mo. Tech. Libr./Trans. Sect.* AD# B059886L.
- Feely, R.A., R.H. Byrne, G.J. Massoth, J.F. Gendron and P.R. Betzer. 1985. Factors influencing the degree of saturation of the surface and intermediate waters of the north Pacific Ocean with respect to aragonite. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results.* NORDA Rep. 78. *Nav. Ocean Res. and Dev. Act.* NSTL, Miss.
- Fenner, D.F. 1978. Sound speed structure across an anticyclonic eddy and the Gulf Stream North Wall. *J. Geophys. Res.* 83: 4599-4605.
- Fisher, A., Jr. 1978. Oceanographic analysis manual for on-scene prediction systems. *Nav. Oceanogr. Off.* NSTL, Miss. AD# A085947. Rep. No. N00-RP-20.
- Flagg, C.N. and R.C. Beardsley. 1978. On the stability of the shelf water/slope water front south of New England. *J. Geophys. Res.* 83: 4623-4631.
- Flanagan, R.P. and X. Zabalgogezcoa. 1979. Effects of ocean fronts on multipath vertical angles and the associated biases in array bearing estimation. *Inst. Acoust. Res.* Miami, Fla. AD# A076117. Rep. No. IAR-79002.

- Floodgate, G.D., G.E. Fogg, D.A. Jones, K. Lochte and C.M. Turley. 1981. Microbiological and zooplankton activity at a front in Liverpool Bay. *Nature* 290: 133-136.
- Floodgate, G.D., K. Lochte and B. Egan. 1982. Observations on the bacteriology of fronts: Some problems of methodology, p. 39-44. In 2nd Symp. on Mar. Microbiol. Marseille.
- Foo, E-C. 1981. A two-dimensional diabatic isopycnal model--simulating the coastal upwelling front. *J. Phys. Oceanogr.* 2: 604-626.
- Formato, R.A. 1979. Wavelike baroclinic disturbances on shallow upper ocean density fronts. Del. Univ., Newark, Coll. Mar. Stud. AD# A076248. Rep. No. CMS-C-1-79.
- Foster, T.D. 1976. Frontal zone mixing and Antarctic bottom water formation in the southern Weddell Sea. *Deep-Sea Res.* 23: 301-317.
- Fournier, R.O. 1977. Biological aspects of the Nova Scotian shelfbreak fronts, p. 69-77. In M.J. Bowman and W.E. Esaias, *Oceanic fronts in coastal processes*. Proc. of a workshop held at the Mar. Sci. Res. Cent., May 25-27, 1977. Springer-Verlag.
- Fournier, R.O., J. Marra, R. Bohrer and M. Van Det. 1977. Plankton dynamics and nutrient enrichment of the Scotian Shelf. *J. Fish. Res. Bd. Can.* 34: 1004-1018.
- Fournier, R.O., M. Van Det, J.S. Wilson and N.B. Hargreaves. 1979. Influence of the shelf-break front off Nova Scotia on phytoplankton standing stock in winter. *J. Fish. Res. Bd. Can.* 36: 1228-1237.
- Freitag, H.P. and D. Halpern. 1981. Hydrographic observations off Northern California during May 1977. *J. Geophys. Res.* 86: 4248-4252.
- Friederich, G.F., L.A. Codispoti and P.J. Kelly. 1985. An inexpensive moored water sampler for investigating chemical variability. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Frontier, S. 1978. Interface between two ecosystems: Examples from the pelagic field. *Inst. Oceanogr., Paris. Annales* 54: 95-105.
- Fukuchi, M. 1980. Phytoplankton chlorophyll stocks in the Antarctic Ocean. *Nippon Kaiyo Gakkai-shi* 36: 73-84.
- Gallagher, J.L., M. Fecher and J. Gorman. 1981. Project HUELVA - oceanographic/acoustic investigation of the western Alboran Sea. Nav. Underwater Syst. Cent. New London, Conn. New London Lab. AD# B055154L. Rep. No. NUSC-TR-6023.
- Gallagher, J.L., F.J. Vernberg, F.P. Diemer [eds.]. 1982. An objective commentary of the current use of satellite data for ocean applications, p. 313-322. In *Processes in marine remote sensing*. Univ. South Carolina Press.

- Gallardo, Y. 1981. On two marine ecosystems of Senegal separated by a peninsula, p. 141-154. In J.C.J. Nihoul [ed ], *Ecohydrodynamics. Proc. 12th Int. Liege Colloq. on Ocean Hydrodyn.* Elsevier. Oceanogr. Ser. 32.
- Gamberoni, L., J. Geronimi, P.F. Jeannin and J.F. Murail. 1982. Study of frontal zones in the Crozet - Kerguelen Region. *Oceanol. Acta* 5: 289-299.
- Garger, Ye.K. 1972. Evaluation of parameters of atmospheric fronts in the lower 300-m layers of the atmosphere. *Inst. Eksp.'Noy Meteorol., Tr.* 2: 33-47.
- Gargett, A.E. 1979. Microstructure and fine structure in an upper ocean frontal regime. *J. Geophys. Res.* 83: 5123-5134.
- Gargett, A.E., T.B. Sanford and T.R. Osborn. 1979. Surface mixing layers in the Sargasso Sea. *J. Phys. Oceanogr.* 9: 1090-1111.
- Garrett, C. 1982. On the parameterization of diapycnal fluxes due to double-diffusive intrusions. *J. Phys. Oceanogr.* 12: 952-959.
- Garrett, C. and E. Horne. 1978. Frontal circulation due to cabbeling and double diffusion. *J. Geophys. Res.* 83: 4651-4656.
- Garrett, C. and J.W. Loder. 1981. Dynamical aspects of shallow sea fronts. *Phil. Trans. R. Soc. Lond. A302*: 563-581.
- Garvine, R.W. 1974. Dynamics of small-scale oceanic fronts. *J. Phys. Oceanogr.* 4: 557-569.
- Garvine, R.W. 1974. Ocean interiors and coastal upwelling models. *J. Phys. Oceanogr.* 4: 121-125.
- Garvine, R.W. 1974. Physical features of the Connecticut River outflow during high discharge. *J. Geophys. Res.* 79: 831-846.
- Garvine, R.W. 1977. Hydrodynamic integral model of oceanic frontal dynamics. *EOS, Trans. Am. Geophys. Union* 58: 892.
- Garvine, R.W. 1979. An integral hydrodynamic model of upper ocean frontal dynamics: Pt. I, Development and analysis. *J. Phys. Oceanogr.* 9: 1-18.
- Garvine, R.W. 1979. An integral hydrodynamic model of upper ocean frontal dynamics: Pt. II, Physical characteristics and comparison with observations. *J. Phys. Oceanogr.* 9: 19-36.
- Garvine, R.W. 1980. Circulation dynamics and thermodynamics of upper ocean density fronts. *J. Phys. Oceanogr.* 10: 2058-2081.
- Garvine, R.W. 1980. Frontal jump conditions for models of shallow, buoyant surface layer hydrodynamics. *Tellus* 33: 301-312.
- Garvine, R.W. 1983. Stationary waves on oceanic density fronts. *Deep-Sea Res.* 30: 245-266.



- Garvine, R.W. 1984. Radial spreading of buoyant, surface plumes in coastal waters. *J. Geophys. Res.* 89: 1989-1996.
- Garvine, R.W. and J.D. Monk. 1974. Frontal structure of a river plume. *J. Geophys. Res.* 79: 2251-2259.
- Gascard, J.C. 1978. Mediterranean deep water formation baroclinic instability and oceanic eddies. *Oceanol. Acta* 1: 315-330.
- George, D.J. 1974. Oceanic front off southeast Iceland. *Mar. Obs.* 44: 32-36.
- Georgi, D.T. 1978. Fine structure in the Antarctic polar front zone: Its characteristics and possible relationship to internal waves. *J. Geophys. Res.* 83: 4579-4588.
- Gerson, D., E. Khedour, P. Gaborski, F.J. Vernberg and F.P. Diemer [eds.]. 1982. Detecting the Gulf Stream from digital infrared data pattern recognition, p. 19-39. In *Processes in marine remote sensing*. Univ. South Carolina Pr.
- Gilmour, A.E. and A.G. Cole. 1979. The subtropical convergence east of New Zealand. *N. Z. J. Mar. Freshw. Res.* 13: 553-557.
- Godfrey, J.S., G.R. Cresswell and F.M. Boland. 1980. Observations of low Richardson numbers and undercurrents near a front in the east Australian Current. *J. Phys. Oceanogr.* 10: 301-307.
- Gong, Y. 1971. A study of the South Korean coastal front. *J. Oceanol. Soc. Korea* 6: 25-36.
- Gordon, A.L. 1977. Antarctic polar front zone in the western Scotia Sea--summer 1975. *J. Phys. Oceanogr.* 7: 309-328.
- Gordon, H.R. and D.K. Clark. 1980. Initial coastal zone color scanner imagery, p. 517-527. In *Proc. 14th Int. Symp. Remote Sens. Environ.* vol. 1.
- Gordon, H.R., D.K. Clark, J.W. Brown, O.B. Brown and R.H. Evans. 1982. Satellite measurement of the phytoplankton pigment concentration in the surface waters of a warm core Gulf Stream ring. *J. Mar. Res.* 40: 491-502.
- Gordon, H.R., D.K. Clark, J.L. Mueller and W.A. Hovis. 1980. Phytoplankton pigments from the Nimbus-7 Coastal Zone Color Scanner: Comparisons with surface measurements. *Science* 210: 63-66.
- Gotz, G. 1972. On the contribution of released latent heat to development of synoptic-scale atmospheric motions. *Idojaras* 76: 79-92.
- Grabowski, W.J. and G.T. Hebenstreit. 1981. Review of ocean models. *Sci. Applic. Inc.*, McLean, Va., NTIS: AD-A098 189/4.
- Grancini, G. and B. Cescon. 1973. Dispersal processes of freshwater in the Po River coastal area. *Limnol. Oceanogr.* 18: 705-710.
- Griffiths, D.K., R.D. Pingree, and M. Sinclair. 1981. Summer tidal fronts in the near-arctic regions of Foxe Basin and Hudson Bay. *Deep-Sea Res.* 28: 865-873.



- Griffiths, R.C. 1965. A study of ocean fronts off Cape San Lucas, lower California. Spec. Sci. Rept. No. 499. U.S. Fish Wildl. Serv.
- Grodon, A.L. 1981. Weddell deep water: Source and variability. *Antarct. J. U.S.* 16: 99-100.
- Grubert, J.P. 1980. Estuarine front formation and propagation. *J. Hydraul. Div. ASCE* 106: 961-975.
- Gruzinov, V.M. 1964. The vertical circulation and the status of frontal zones in the central part of North Atlantic. *Okeanologiya* 3: 408-411.
- Gruzinov, V.M. 1966. Drift circulation in the zone of the subarctic hydrological front. *Tr. Gos. Okeanogr. Inst.* No. 79: 117-122.
- Gruzinov, V.M. 1966. Hydrological front as a natural boundary of inherent zones in the ocean. *Tr. Gos. Okeanogr. Inst.* No. 84: 252-262.
- Gruzinov, V.M. and K.A. Chekotillo. 1965. A note on the dynamic description of the subpolar front in the North Atlantic. *Dokl. Akad. Nauk USSR. Earth Sci. Sect.* 133: 21-23.
- Guffy, J.D. and D.C. Biggs. 1985. Nutrient variability across an oceanic frontal zone in the eastern Scotia Sea. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.*
- Gunn, J.T. 1979. Variations in the position of the shelf water front off the Atlantic Coast between Georges Bank and Cape Romain in 1976, p. 301-314. In *Ocean variability in the U.S. Fishery Conservation Zone. Natl. Mar. Fish. Serv. Tech. Rep. NMFS Circ. 427.*
- Gutman, L.N. and L.N. Mal'ko. 1961. On the theory of fronts. *Proc. (Dokl.) Acad. Sci. USSR* 138.
- Halliwel, G.R. and C.N.K. Mooers. 1978. Comparison of hydrographic, acoustic, and inertial-internal wave properties of Gulf-Stream and Georges Bank shelf water-slope water fronts. *EOS, Trans. Am. Geophys. Union* 59: 491.
- Halliwel, G.R. and C.N.K. Mooers. 1978. Low-frequency variability and horizontal structure of shelf water-slope water and Gulf-Stream fronts. *EOS, Trans. Am. Geophys. Union* 59: 303.
- Halliwel, G.R., Jr. and C.N.K. Mooers. 1979. The space-time structure and variability of the shelf water-slope water and Gulf Stream surface temperature fronts and associated warm-core eddies. *J. Geophys. Res.* 84: 7707-7725.
- Halliwel, G.R. and C.N.K. Mooers. 1983. Meanders of the Gulf-Stream downstream from Cape Hatteras 1975-1978. *J. Phys. Oceanogr.* 13: 1275-1292.
- Hallock, Z.O. 1985. The exchange of heat and salt across the Iceland-Faeroe Oceanic Front. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.*

- Haltiner, G.J. and F.L. Martin. 1957. Frontogenesis, p. 287-296. In Dynamical and physical meteorology. McGraw Hill.
- Haltiner, G.J. and F.L. Martin. 1957. Surfaces of discontinuity, p. 297-307. In Dynamical and physical meteorology. McGraw Hill.
- Hamilton, G.D. 1972. The effects of oceanic fronts on properties of the atmospheric boundary layer. U.S. Nav. Postgrad. Sch., Monterey, Calif. Environ. Predict. Res. Facil. Tech. Pap. No. 2-72.
- Hanson, R.B. 1981. Microbial dynamics in Antarctic waters, Drake Passage. Antarct. J. U.S. 15: 134-135.
- Hanson, R.B., D. Shafer, T. Ryan, D.H. Pope and H.K. Lowery. 1983. Bacterioplankton in Antarctic Ocean waters during late Austral Winter: Abundance, frequency of dividing cells, and estimates of production. Appl. Environ. Microbiol. 45: 1622-1632.
- Hanson, W.E. [n.d.]. Nutrient study of mesoscale thermal features off Point Sur, California. U.S. Nav. Postgrad. Sch., Monterey, Calif.
- Harashima, A. and Y. Oonishi. 1981. The Coriolis Effect against frontogenesis in steady buoyancy-driven circulation. J. Oceanogr. Soc. Japan 37: 49-59.
- Harashima, A., Y. Oonishi and H. Kunishi. 1978. Formation of water masses and fronts due to density-induced current system. J. Oceanogr. Soc. Japan 34: 57-66.
- Harvey, J. 1982. Theta-S relationships and water masses in the eastern North Atlantic. Deep-Sea Res. 29: 1021-1033.
- Hasunuma, K. 1978. Formation of the intermediate salinity minimum in the northwestern Pacific Ocean. Tokyo. Univ. Ocean Res. Inst. Bull. No. 9.
- Hayes, S.P. and D. Halpern. 1976. Observations of internal waves and coastal upwelling off the Oregon Coast. J. Mar. Res. 34: p. 247-267.
- Heath, R.A. 1968. Geostrophic currents derived from oceanic density measurements north and south of the subtropical convergence east of New Zealand. N. Z. J. Mar. Freshw. Res. 2: 659-677.
- Heath, R.A. 1975. Oceanic circulation off the east coast of New Zealand. Wellington, N.Z. Oceanogr. Inst. Mem. 55.
- Heath, R.A. 1976. Models of the diffusive-advective balance at the subtropical convergence. Deep-Sea Res. 23: 1153-1164.
- Heath, R.A. 1981. Oceanic fronts around southern New Zealand. Deep-Sea Res. 28A: 547-560.
- Heaton, M.G., R.J. Wilke and M.J. Bowman. 1980. Formation of tar balls in a simulated oceanic front. Tex. J. Sci. 32: 265-268.

- Hennigar, H.F. and S.K. Schaffner. 1982. Norsex 1979 microwave remote sensing data report. NASA Cont. Rep. 165967, U.S. Natl. Aero. Space Adm., Langley Res. Cent., Va. NTIS: 2-33796/5.
- Herman, A.W. and K.L. Denman. 1979. Intrusions and vertical mixing at the shelf/slope water front south of Nova Scotia. *J. Fish. Res. Board Can.* 36: 1445-1453.
- Hilland, J.E. 1980. Variation in the shelf-water front position from Georges Bank to Cape Romain in 1980. *Ann. Biol.* 37: 38-40.
- Hilland, J.E. and R.S. Armstrong. 1980. Variation in the shelf water front position from Georges Bank to Cape Romain in 1978. *Ann. Biol.* 35: 46-50.
- Hillman, N.S. 1966. Ecology of skeletal plankton. *Antarct. J. U.S.* 1: 214-215.
- Hisard, P. 1975. Le courant de Lomonosov et la formation de la zone frontale du Cap Lopez (Baie de Biafra, Golfe de Guinée). *Cah. O.R.S.T.O.M. Ser. Oceanogr.* 13: 107-116.
- Hofmann, E.E., W.D. Nowlin, Jr. and T. Whitworth III. 1985. Effects of frontal exchange processes in the Antarctic circumpolar current at Drake Passage. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Hoge, F.E. and R.N. Swift. 1982. Delineation of estuarine fronts in the German Bight using airborne laser-induced water Raman backscatter and fluorescence of water column constituents. *Int. J. Remote Sens.* 3: 475-495.
- Hoge, F.E. and R.N. Swift. 1983. Airborne dual laser excitation and mapping of phytoplankton photopigments in a Gulf Stream warm core ring. *App. Opt.* 22: 2272-2281.
- Holligan, P.M. 1978. Dinoflagellate blooms associated with tidal fronts around the British Isles, p. 249-256. In D.L. Taylor and H.H. Seligen [eds.], *Toxic dinoflagellate blooms*. Proc. 2nd Int. Conf. on Toxic Dinoflagellate Blooms. Develop. in Mar. Biol. vol. 1.
- Holligan, P.M. 1981. Biological implications of fronts on the northwest European continental shelf. *Phil. Trans. R. Soc. Lond.* A302: 547-562.
- Holligan, P.M. 1985. Some chemical implications of phytoplankton distributions in frontal systems on the N.W. European shelf. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Holligan, P.M., R.P. Harris, R.C. Newell, D.S. Harbour, R.N. Head, E.A.S. Linley, M.I. Lucas, P.R.G. Tranter and C.M. Weekley. 1984. Vertical distribution and partitioning of organic carbon in mixed, frontal and stratified waters of the English Channel. *Mar. Ecol. Prog. Ser.* 14: 111-127.
- Holligan, P.M., M. Viollier, C. Dupouy and J. Aiken. 1983. Satellite studies on the distribution of chlorophyll and dinoflagellate blooms in the western English Channel. *Cont. Shelf Res.* 2: 81-96.

- Holligan, P.M., M. Viollier, D.S. Harbour, P. Camus and M. Champagne-Philippe. 1983. Satellite and ship studies of coccolithophore production along a continental shelf edge. *Nature* 304: 339-342.
- Holligan, P.M., P.J. leB. Williams, D. Purdie and R.P. Harris. 1984. Photosynthesis, respiration and nitrogen supply of plankton populations in stratified, frontal and tidally mixed shelf waters. *Mar. Ecol. Prog. Ser.* 17: 201-213.
- Hood, C.A. and J.M. Bane, Jr. 1983. Subsurface energetics of the Gulf Stream cyclonic frontal zone off Onslow Bay, North Carolina. *J. Geophys. Res.* 88: 4651-4662.
- Horne, E.P.W. 1977. Physical aspects of the Nova Scotian shelfbreak fronts, p. 59-68. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes. Proc. of a workshop held at the Mar. Sci. Res. Cent., May 25-27, 1977.* Springer-Verlag.
- Horne, E.P.W. 1978. Interleaving at the subsurface front in the slope water off Nova Scotia. *J. Geophys. Res.* 83: 3659-3671.
- Horne, E.P.W., M.J. Bowman and A. Okubo. 1977. Crossfrontal mixing and cabbeling, p. 105-113. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes. Proc. of a workshop held at the Mar. Sci. Res. Cent., May 25-27, 1977.* Springer-Verlag.
- Horton, C.W. 1984. Surface front displacement in the Gulf Stream by hurricane/tropical storm Dennis. *J. Geophys. Res.* 89: 2005-2012.
- Houghton, R.W. and J. Marra. 1983. Physical/biological structure and exchange across the thermohaline shelf/slope front in the New York Bight. *J. Geophys. Res.* 88: 4467-4481.
- Houtman, Th.J. 1964. Surface temperature gradients at the Antarctic Convergence. *N. Z. J. Geol. Geophys.* 1964: 245-270.
- Houtman, Th.J. 1967. Water masses and fronts in the Southern Ocean south of the New Zealand. 24 stations. *N. Z. Dep. Sci. Ind. Res. Bull. No.* 174: 1-40.
- Hovis, W.A., D.K. Clark, F. Anderson, R.W. Austin, W.H. Wilson, E.T. Baker, D. Ball, H.R. Gordon, J.L. Mueller, S.Z. El-Sayed, B. Sturm, R.C. Wrigley and C.S. Yentsch. 1980. Nimbus-7 Coastal Zone Color Scanner: System description and initial imagery. *Science* 210: 60-63.
- Hsueh, Y. and B. Cushman-Roisin. 1983. On the formation of surface to bottom fronts over steep topography. *J. Geophys. Res.* 88: 743-750.
- Huang, C.K. 1970. The thermal current structure in Lake Michigan. *Spec. Rep. No.* 43. Great Lakes Res. Div., Univ. of Mich.
- Huang, N.E. and C.D. Leitaó. 1978. Large-scale Gulf Stream frontal study using Geos 3 radar altimeter data. *J. Geophys. Res.* 83: 4673-4682.
- Hughes, R. 1982. On a front between two rotating flows with application to the Flores Sea. *Dyn. Atmos. Oceans* 6: 153-176.



- Huh, O.K. 1976. Detection of oceanic thermal fronts off Korea with the defense meteorological satellites. *Remote Sens. Environ.* 5: 191-213.
- Huh, O.K. and T. Shim. 1985. Winter-season fronts and eddies in the Korea Strait and Sea of Japan. In D.A. Wiesenbunrg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Huh, O.K., W.J. Wiseman, Jr. and J.L. Rouse, Jr. 1978. Winter cycle of sea surface thermal patterns, northeastern Gulf of Mexico. *J. Geophys. Res.* 83: 4523-4529.
- Hunt, G.L., Jr. 1982. Distribution and abundance of marine birds in the Ross and Bellingshausen Seas. *Antarct. J. U.S.* 17: 179.
- Huzzey, L.M. 1982. The dynamics of a bathymetrically arrested estuarine front. *Estuarine, Coastal Shelf Sci.* 15: 537-552.
- Ichiye, T. 1982. Frontal baroclinic instability of the Antarctic front zone. *Antarct. J. U.S.* 17: 116-117.
- Ikeda, M., W.J. Emery and L.A. Mysak. 1984. Seasonal variability in meanders of the California system off Vancouver Island. *J. Geophys. Res.* 89: 3487-3505.
- Ikeda, M., L.A. Mysak and W.J. Emery. 1983. Observation and modeling of satellite-sensed meanders and eddies off Vancouver Island. *J. Phys. Oceanogr.* 14: 3-21.
- Incze, L.S. and C.M. Yentsch. 1981. Stable density fronts and dinoflagellate patches in a tidal estuary. *Estuarine Coastal Shelf Sci.* 13: 547-556.
- Ingham, M.C. 1976. Variations in the shelf water front off the Atlantic Coast between Cape Hatteras and Georges Bank. U.S. Dep. of Commer. *MARMAP Contrib.* No. 140. [unpubl.].
- Ingham, M.C., R.S. Armstrong, J.L. Chamberlin, S.K. Cook, D.G. Mountain, R.J. Schlitz, J.P. Thomas, J.J. Bisagni, J.F. Paul and C.E. Warsh. 1982. Summary of the physical oceanographic processes and features pertinent to pollution distribution in the coastal and offshore waters of the northeastern United States, Virginia to Maine. NOAA Tech. Memo NMFS-F/NEC. NTIS Order No.: PB83-156364.
- Ingram, R.G. 1976. Characteristics of a tide-induced estuarine front. *J. Geophys. Res.* 81: 1951-1959.
- Ingram, R.G. 1981. Characteristics of the Great Whale River plume. *J. Geophys. Res.* 86: 2017-2023.
- Isouchi, T., Y. Kurita and I. Yamazi. 1979. Summer distribution of plankton communities in the surface water from the south coast of Honshu to Satsunan Islands Japan. *J. Tokyo Univ. Fish.* 65: 99-126.
- Iverson, R.L., L.K. Coachman, R.T. Cooney, T.S. English, J.J. Goering, G.L. Hunt, Jr., M.C. Macauley, C.P. McRoy, W.S. Reeburg and T.E. Whitledge. 1979. Ecological significance of fronts in the southeastern Bering Sea, p. 437-466. In R.J.



Livingston [ed.], Ecological processes in coastal and marine systems. Mar. Sci. vol. 10. Plenum.

- Iverson, R.L., S.L. Smith, J. Vidal and T. Whittedge. 1985. Phytoplankton productivity related to the Bering Sea fronts. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Iverson, R.L., T.E. Whittedge and J.J. Goering. 1979. Chlorophyll and nitrate fine structure in the southeastern Bering Sea shelf break front. Nature 281: 664-666.
- Iwasaki, Y. 1969. Movement of the thermal equator and the fishing grounds mainly for yellow-fin tuna in the Indian Ocean. Jap. Soc. Sci. Fish. Bull. 35: 957-963.
- Jacobs, C.A. 1978. Observed oceanic variability at and near the air-sea interface during Phase III of Project BOMEX. J. Phys. Oceanogr. 8: 103-118.
- Jacobs, S.S., A.L. Gordon and A.F. Amos. 1979. Effect of glacial ice melting on the Antarctic surface water. Nature 277: 469-471.
- Jacobsen, T.R., L.R. Pomeroy and J.O. Blanton. 1983. Autotrophic and heterotrophic abundance and activity associated with a nearshore front off the Georgia Coast, U.S.A. Estuarine Coastal Shelf Sci. 17: 509-520.
- James, I.D. 1977. A model of the annual cycle of temperature in a frontal region of the Celtic Sea. Estuarine Coastal Mar. Sci. 5: 339-353.
- James, I.D. 1978. A note on the circulation induced by a shallow-sea front. Estuarine Coastal Mar. Sci. 7: 197-202.
- James, I.D. 1981. Fronts and shelf-circulation models. Phil. Trans. R. Soc. Lond. A302: 597-604.
- James, I.D. 1984. A three-dimensional numerical shelf-sea front model with variable eddy viscosity and diffusivity. Cont. Shelf Res. 3: 69-98.
- Johannessen, O.M. 1977. Observation of an oceanic front in the Ionian Sea during early winter 1970. J. Geophys. Res. 82: 1381-1391.
- Johannessen, O.M., F. Destrobel and C. Gehen. 1971. Observations of an oceanic frontal system east of Malta in May 1971 (May frost). U.S. Natl. Tech. Inf. Serv. Gov. Rep. Announce. 71.
- Johannessen, O.M. and L.A. Foster. 1978. A note on the topographically controlled oceanic polar front in the Barents Sea. J. Geophys. Res. 83: 4567-4571.
- Johnson, D.A. and C. Nigrini. 1980. Radiolarian biogeography in surface sediments of the western Indian Ocean. Mar. Micropaleontol. 5: 111-152.
- Johnson, D.A. and C. Nigrini. 1982. Radiolarian biogeography in surface sediments of the eastern Indian Ocean. Mar. Micropaleontol. 7: 237-281.

- Johnson, D.R., E.D. Barton, P. Hughes and C.N.K. Mooers. 1975. Circulation in the Canary Current upwelling region off Cabo Bojador in August, 1972. *Deep-Sea Res.* 22: 547-558.
- Johnson, J.A. 1978. A model of narrow jets in a zonal ocean. *J. Geophys. Res.* 83: 4657-4658.
- Johnson, K.S., R.L. Petty, B.B. Prezelin and J.L. Cox. 1985. Distribution of nitrate, chlorophyll fluorescence, and primary productivity across a thermal front in the Santa Barbara Channel. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Johnson, W.R. and C.N.K. Mooers. 1978. Near-inertial motions in Oregon upwelling frontal zone. *EOS, Trans. Am. Geophys. Union* 59: 491.
- Johnson, W.R., J.C. Van Leer and C.N.K. Mooers. 1976. A cyclesonde view of coastal upwelling. *J. Phys. Oceanogr.* 6: 556-574.
- Jones, J.H. and W.S. Wooster. 1967. Stability in the vicinity of an oceanic front, p. 10. In *Pac. Sci. Congr. Proc.* vol.2: Physical oceanography.
- Joyce, T.M. 1977. A note on the lateral mixing of water masses. *J. Phys. Oceanogr.* 7: 626-629.
- Joyce, T.M. 1978. The anatomy of the antarctic polar front in the Drake Passage. *J. Geophys. Res.* 83: 6093-6113.
- Joyce, T.M. 1985. Upper ocean mesoscale fronts, with emphasis on the northwest Atlantic and warmcore rings. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Joyce, T.M. and S.L. Patterson. 1977. Cyclonic ring formation at the polar front in the Drake Passage. *Nature* 265: 131-133.
- Joyce, T.M., S.R. Rintoul, Jr. and R.L. Barbour. 1982. Description and evaluation on the acoustic profiling of ocean currents (APOC) system used on R.V. Oceanus Cruise 96 on 11-22 May 1981. *Cont. Rep. U.S. Natl. Aero. Space Adm.* NTIS Order No.: N83-13771/1.
- Joyce, T.M. and M.C. Stalcup. 1984. An upper ocean current jet and interval waves in a Gulf Stream warm core ring. *J. Geophys. Res.* 89: 1997-2003.
- Kalazhokov, K.H.KH. 1964. On the dynamical structure of fronts. *Acad. Sci. USSR Geophys. Bull.* 1964: 74-79.
- Kalazhokov, K.H.KH. and S.V. Morgachev. 1971. Problem of the investigation of the spatial structure of fronts and frontal cloudiness by the method of total currents. *Vysokogorn. Geofiz. Inst., Trudy*: 19: 19-31.
- Kang, Y.Q. and L. Magaard. 1982. Annual temperature fluctuations at the subtropical and subarctic fronts in the central North Pacific. *J. Geophys. Res.* 87: 5663-5665.

- Kao, T.W. 1977. Buoyant surface discharge and small-scale oceanic fronts: A numerical study. *J. Geophys. Res.* 82: 1747-1752.
- Kao, T.W. 1980. Dynamics of oceanic fronts. Part I: The Gulf Stream. *J. Phys. Oceanogr.* 10: 483-492.
- Kao, T.W. 1981. Addendum to the dynamics of oceanic fronts. Part I: The Gulf Stream. *J. Phys. Oceanogr.* 11: 568-569.
- Kao, T.W. 1981. The dynamics of oceanic fronts. Part II: Shelf water structure due to freshwater discharge. *J. Phys. Oceanogr.* 11: 1215-1223.
- Kao, T.W. 1983. Physical aspects of a length scale for the Gulf Stream front. *J. Geophys. Res.* 88: 6067-6068.
- Kao, T.W. and R.E. Cheney. 1982. The Gulf Stream front: A comparison between SEASAT altimeter observations and theory. *J. Geophys. Res.* 87: 539-545.
- Kao, T.W., H.-P. Pao and C. Park. 1978. Surface intrusions, fronts, and internal waves: A numerical study. *J. Geophys. Res.* 83: 4641-4650.
- Karabashev, G.S. and S.A. Khanaev. 1983. Distribution of chlorophyll fluorescence of the temperature front in the Baltic Sea. *Okeanologia* 23: 857-862.
- Karabasheva, E.I., V.T. Paka and K.N. Fedorov. 1979. How frequent are thermal fronts in the ocean? *Oceanology* 18: 657-662.
- Kasahara, S. 1978. Descriptions of offshore squid angling in the Sea of Japan, with special reference to the distribution of common squid (*Todarodes pacificus* Steenstrup); and on the techniques for forecasting fishing conditions. *Bull. Jap. Sea Reg. Fish. Res. Lab.* 29: 179-199.
- Katz, E.J. 1969. Further study of a front in the Sargasso Sea. *Tellus* 21: 259-269.
- Katz, E.J. 1969. Physical oceanography on a biological cruise. *Oceanus* 15: 7.
- Kawai, H. 1972. Hydrography of the Kuroshio Extension, p. 235-352. In M. Stommel and N. Yoshida [eds.], *Kuroshio, physical aspects of the Japan Current*. Univ. Wash. Pr.
- Kenya, V.S. 1982. New data on the migrations and distribution of Pacific sardines in the Northwest Pacific. *Sov. J. Mar. Biol.* 8: 41-48.
- Kharitonov, V.N. and M.N. Myznikova. 1982. Water mass analysis as a means of distinguishing frontal zones along the Australia-Antarctic transect. *Polar Geogr.* 6: 259-266.
- Khvatskiy, N.V. 1970. On the frontal zone of the Scotia Sea. *Oceanology* 9: 777-783.
- Kibblewhite, A.C. 1972. Sound velocity structure of the ocean south of Australia and New Zealand, p. 41-49. In D.E. Hayes [ed.], *Antarctic oceanology II: The Australian-New Zealand sector*. Am. Geophys. Union. Ant. Res. Ser. vol.19.

- Kibblewhite, A.C. and D.G. Browning. 1978. The identification of major oceanographic fronts by long range acoustic propagation measurements. *Deep-Sea Res.* 25: 1107-1118.
- Kimmerer, W.J., T.W. Walsh, J. Hirota, B.J. Neilson and L.E. Cronin, [eds.]. 1981. The effects of sewage discharge into a wind-induced plume front, p. 531-548. In *Estuaries and nutrients. Humana.*
- Kinder, T.H. and L.K. Coachman. 1978. The front overlaying the continental slope in the eastern Bering Sea. *J. Geophys. Res.* 83: 4551-4559.
- Kinder, T.H., G.L. Hunt, Jr., D. Schneider and J.D. Schumacher. 1983. Correlations between seabirds and oceanic fronts around the Pribilof Islands, Alaska. *Estuar. Coast. Shelf Sci.* 16: 309-319.
- Kirby, R. and W.R. Parker. 1982. A suspended sediment front in the Severn Estuary. *Nature* 295: 396-399.
- Kirwan, A.D., Jr., N.L. Guinasso, Jr. and G. McNally. 1978. Sea surface temperatures in the North Pacific through the winter 1976-1977 from Nimbus 6. *J. Geophys. Res.* 83: 5505-5506.
- Kishi, A. 1977. The subtropical mode water and the equatorial water of the western Pacific Ocean with reference to the oceanic fronts eddies and upwelling which affect fisheries. *J. Fac. Mar. Sci. Technol. Tokai Univ. Spec. No:* 75-198.
- Klemas, V. 1980. Remote sensing of coastal fronts and their effects on oil dispersion. *Int. J. Remote Sens.* 1: 11-28.
- Klemas, V. and D.F. Polis. 1977. A study of density fronts and their effects on coastal pollutants. *Remote Sens. Environ.* 6: 95-126
- Klemas, V. and D.F. Polis. 1977. Remote sensing of estuarine fronts and their effects on pollutants. *Photogramm. Eng. Remote Sens.* 43: 599-612.
- Knauss, J.A. 1957. An observation of an oceanic front. *Tellus* 9: 234-237.
- Kort, V.G. 1964. Antarctic oceanography, p. 309-333. In H. Odsishaw [ed.], *Research in geophysics. vol. 2. M.I.T. Pr.*
- Kort, V.G. 1968. Frontal zones of the Southern Ocean, p. 3-7. In *Symposium on Antarctic oceanography. Papers. Int. Counc. Sci. Unions, Sci. Comm. Antarct. Res. (SCAR), Sci. Comm. Oceanic Res. (SCOR), Int. Assoc. Phys. Oceanogr. (IAPO) and Int. Union Biol. Sci. (IUBS).*
- Kort, V.G., V.B. Titov and A.S. Osadchiy. 1977. Kinematics and structure of currents in a study area in the Norwegian Sea. *Oceanology* 17: 505-508.
- Kozlov, V.F. 1970. A model of the meandering of inertial currents in a baroclinic ocean. *Atmos. Oceanic Phys.* 6: 922-933.
- Kozlov, V.F. 1971. Experimental computation of currents in the subarctic frontal zone in the northwestern Pacific Ocean. *Oceanology* 11: 477-485.



- Kozlov, A.N., T.A. Lukasheva, V.V. Maslennikov, V.A. Spiridonov, B.M. Shatokhin, K.I. Yudanov and T.G. Lyubimova [eds.]. 1983. Hydrological conditions in the southern Scotia Sea as related to distribution and biological state of Antarctic krill, p. 85-98. In Antarctic krill: Distribution pattern and environment. Legkaya i Pischevaya Promy-shlennost.
- Kraus, E.B. 1977. Modelling and prediction of the upper layers of the ocean. In J.C. Swallow [ed.], Pergamon marine series, vol. 1. Pergamon.
- Kremling, K. 1983. Trace metal fronts in European shelf waters. Nature 303: 225-227.
- Kullenberg, G. 1978. Light-scattering observations in frontal zones. J. Geophys. Res. 83: 4683-4690.
- Kun, M.S., Yu.V. Novikov and V.P. Pavlychev. 1979. The effect of oceanological conditions on the formation of productive zones and abundance of epipelagic fishes in the Kuroshio water system. Sov. J. Mar. Biol. 4: 585-591.
- Kunze, E. 1985. Near-internal wave interaction with geostrophic shear. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Kunze, E. and T.B. Sanford. 1984. Observations of near-inertial waves in a front. J. Phys. Oceanogr. 14: 566-581.
- Laevastu, T. and E. Ayres. 1966. Numerical synoptic analyses of heat exchange and their use in ocean thermal structure prediction. Fleet Num. Weather Fac. Tech. Note 26.
- Laevastu, T. and E.C. Lafond. 1970. Oceanic fronts and their seasonal positions on the surface. Nav. Undersea Res. Dev. Cent. Tech. Pub. 204.
- Laevastu, T., K. Rabe and G.D. Hamilton. 1972. The effects of oceanic fronts on properties of the atmospheric boundary layer. U.S. Nav. Postgrad. Sch. Environ. Predict. Res. Facil. Tech. Pap. No. 2-72.
- Lafond, E.C. and K.G. Lafond. 1967. Internal thermal structures in the ocean. J. of Hydronautics 1: 48-53.
- Lafond, E.C. and K.G. Lafond. 1971. Thermal structure through the California front, factors affecting underwater sound transmission measured with a towed thermistor chain and attached current meters. Nav. Undersea Res. and Dev. Cent. San Diego. Rep. NUC-TP-224.
- Lafond, E.C. and A.T. Moore. 1970. Measurements of thermal structure between southern California and Hawaii with the thermistor chain. Navy Electron. Lab. Tech. Rep. 1210.
- Lafond, E.C. and E.L. Smith. 1970. Temperature and current in and near the Kuroshio, p. 69-78. In J.C. Marr [ed.], The Kuroshio: A symposium on the Japan current. East-West Cent. Pr.

- LaRock, P.A., D.F. Reid and D.A. Wiesenburger. 1985. Microbial activity and biomass in a warm-core ring. In D.A. Wiesenburger and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Laurs, R.M. 1975. The association of oceanic boundary features and albacore tuna in the northeast Pacific, p. 23-30. In W.R. Danielson [ed.], STD conference and workshop proceedings. Plessey Environ. Syst.
- Laurs, R.M., H.S.H. Yuen and J.H. Johnson. 1977. Small scale movements of albacore *Thunnus-alalunga* in relation to ocean features as indicated by ultrasonic tracking and oceanographic sampling. U.S. Natl. Mar. Fish. Serv. Fish. Bull. 75: 347-356.
- La Violette, P.E. 1985. The problem of integrating remote sensing and conventional data in the study of ocean fronts. In D.A. Wiesenburger and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- La Violette, P.E. 1981. Remote sensing oceanography: A synoptic approach. Nav. Ocean Res. and Dev. Act. NSTL, Miss. AD #A099797. Rep. No. NORDA-TN-100.
- LeBlond, P.H. 1983. The Strait of Georgia: Functional anatomy of a coastal sea. Can. J. Fish. Aquat. Sci. 40: 1033-1063.
- Ledenev, V.G. 1965. Direction of surface currents in the west and wind drift zone. Soviet Antarctic Expedition. Inf. Bull. 5: 198-200. °°
- Lee, T.N. 1983. Low-frequency current and temperature variability from Gulf Stream frontal eddies and atmospheric forcing along the southeast U.S. outer continental shelf. J. Geophys. Res. 88: 4541-4567.
- Leetmaa, A. 1976. The influence of deep mesoscale eddies on sea surface temperature in the north Atlantic subtropical convergence. J. Phys. Oceanogr. 6: 953-961.
- Leetmaa, A. and A.D. Voorhis. 1978. Scales of motion in the subtropical convergence zone. J. Geophys. Res. 83: 4589-4592.
- Le Fevre, J. 1979. On the hypothesis of a relationship between dinoflagellate [sic] blooms and the Amoco-Cadiz oil spill. J. Mar. Biol. Assoc. U.K. 59: 525-528.
- Le Fevre, J., M. Viollier, P. Le Corre, C. Dupouy and J.-R. Grall. 1983. Remote sensing observations of biological material by LANDSAT along a tidal thermal front and their relevancy to the available field data. Estuarine, Coastal Shelf Sci. 16: 37-50.
- Legeckis, R. 1975. Application of synchronous meteorological satellite data to the study of time dependent sea surface temperature changes along the boundary of the Gulf Stream. Geophys. Res. Lett. 2: 435-438.
- Legeckis, R. 1978. A survey of worldwide sea surface temperature fronts detected by environmental satellites. J. Geophys. Res. 83: 4501-4522.

- Legeckis, R. and J.M. Bane, Jr. 1983. Comparison of the TIROS-N satellite and aircraft measurements of Gulf Stream surface temperatures. *J. Geophys. Res.* 88: 4611-4616.
- Legeckis, R. and G. Cresswell. 1981. Satellite observations of sea-surface temperature fronts off the coast of western and southern Australia. *Deep-Sea Res.* 28: 297-306.
- Legendre, L. and J.C.J. Nihoul, [eds.]. 1981. Hydrodynamic control of marine phytoplankton production: The paradox of stability, p. 141- 154. In *Ecohydrodynamics*. Elsevier Oceanogr. Ser. vol. 32. Elsevier.
- Le Guen, J.C. and R. Chevalier. 1982. Marine environment and fishing. 10th Symp. on Ocean Exploit., Paris. Colloq. Assoc. Sci. Tech. Exploit. Oceans. (ASTE0) No. C: 151-165.
- Leigh-Abbott, M.R., J.A. Coil, T.M. Powell and P.J. Richerson. 1978. Effects of a coastal front on the distribution of chlorophyll in Lake Tahoe, California-Nevada. *J. Geophys. Res.* 83: 4668-4672.
- Leitao, C.D., N.E. Huang and C.G. Parra. 1979. A note on the comparison of radar altimetry with IR and in situ data for the detection of the Gulf Stream surface boundaries. *J. Geophys. Res.* 84: 3969-3973.
- Leming, T.D. 1985. Coastal zone color scanner pigment observations in coastal Louisiana waters and their relationship to bottom water hypoxia. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Leone, G.M. and R.B. Lorens. 1985. Chemical measurements in the vicinity of the Iceland-Faeroe Ridge. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Levine, E.R. 1980. Seasonal variability of long-range acoustic propagation through the Subarctic front in the eastern North Pacific. *Nav. Underwater Syst. Cent.* Newport, R.I. AD# B046168L. Rep. No. NUSC-TR-5834.
- Levine, E.R. and W.B. White. 1972. Thermal frontal zones in the eastern Mediterranean Sea. *J. Geophys. Res.* 77: 1081-1086.
- Levine, E.R. and W.B. White. 1978. Observations of thermal fronts in mid latitude north Pacific from January 76 to June 77. *EOS, Trans. Am. Geophys. Union.* 59: 302.
- Levine, E.R. and W.B. White. 1978. Variability of frontal region of Kuroshio extension, June 76-May 77. *EOS, Trans. Am. Geophys. Union.* 59: 1108-1109.
- Levine, E.R. and W.B. White. 1981. Large-scale synoptic thermal fronts in the mid-latitude North Pacific from 1976-1978. *J. Geophys. Res.* 86: 6567-6579.
- Levine, E.R. and W.B. White. 1983. Bathymetric influences upon the character of North Pacific fronts. *J. Geophys. Res.* 88: 9617-9625.

- Lewis, J.K. 1979. Coastal frontal systems as a pollutant control mechanism for offshore energy production, p. 389-396. In Ocean energy. 15th Annu. Conf., Oct. 10-12, 1979, New Orleans, La. Mar. Technol. Soc.
- Lewis, J.K. 1982. On the nearshore hydrography of the upper Texas coast., Diss. Tex. A & M Univ.
- Loomis, P.B. 1979. Tactical use of strong ocean fronts. Report No. 26, Nav. Oceanogr. Off. NSTL, Miss. AD# C018163.
- Lough, R.G. and W.R. Wright. 1979. Preliminary observations on the interaction of the oceanographic front and plankton populations along the northeastern edge of Georges Bank during October 1978. In 42nd Annu. Meet. Amer. Soc. of Limnol. and Oceanogr., Inc. Abstr. pap.
- Lozovatskiy, I.D. 1978. Short-period variability of the temperature field in the near-shore zone of the sea. *Okeanologia* 18: 602-607.
- Lozovatskiy, I.D. and R.V. Ozmidov. 1979. Statistical characteristics of the local structure of developed small-scale turbulence in the Kuroshio Current. *Oceanology* 19: 503-508.
- Lukashev Yu.F. and A.M. Chernyakova. 1979. Variability of nitrate fields associated with the passage of eddy formations. *Oceanology* 19: 409-413.
- Lutjeharms, J.R.E. 1981. Interaction between the Agulhas Current and the subtropical convergence. CSIR Res. Rept. 384, Council for Scientific and Industrial Research, Stellenbosch, South Africa, 39 p.
- Lutjeharms, J.R.E. 1983. Position and type of Southern Ocean fronts; Ligging en aard van Suidelike Oseaan-fronte. In 5th Natl. Oceanogr. Symp. 24-28 January 1983. Rhodes Univ. Grahamstown, S. Afr.
- Lutjeharms, J.R.E. and D.J. Baker, Jr. 1980. A statistical analysis of the meso-scale dynamics of the Southern Ocean. *Deep-Sea Res.* 27: 145-159.
- Lutjeharms, J.R.E. and H.R. Valentine. 1984. Southern Ocean thermal fronts south of Africa. *Deep-Sea Res.* In press.
- Machida, S. 1970. Consideration on the latitudinal fluctuation of the Antarctic convergence and the catch per unit effort of Baleen whales. *Japan. Soc. Sci. Fish. Bull.* 36: 885-888.
- Machida, S. 1975. Distribution of sperm whale catches in the southern Indian Ocean. *Whales Res. Inst. Tokyo. Sci. Rep.* 27: 141-157.
- Mackintosh, N.A. 1964. Distribution of the plankton in relation to the Antarctic convergence. *R. Soc. Lond. Proc. Ser. A*, 281: 21-38.
- Magnier, Y. and B. Piton. 1973. Les masses d'eau de l'océan Indien a l'ouest at au nord de Madagascar au debut de l'ete Austral. *Cah. O.R.S.T.O.M. Ser. Oceanogr.* 11: 97-113.



- Malone, T.C., T.S. Hopkins, P.G. Falkowski and T.E. Whitledge. 1983. Production and transport of phytoplankton biomass over the continental shelf of the New York Bight. *Cont. Shelf Res.* 1: 305-337.
- Mamaeva, N.V. 1982. Planktonic infusorians of the central part of the Indian Ocean. *Sov. J. Mar. Biol.* 8: 254-258.
- Mamaeva, N.V. 1982. Some data on the quantitative distribution of infusoria in the northern Atlantic. *Oceanology* 22: 462-464.
- Markl, R.G. 1972. Visible oceanic saline fronts, p. 49-62. In A.L. Gordon [ed.], *Studies in physical oceanography: A tribute to George Wust on his 80th birthday*. Gordon and Breach Science Pub., New York.
- Marra, J., R.W. Houghton, D.C. Boardman and P.J. Neale. 1982. Variability in surface chlorophyll-a at a shelf-break front. *J. Mar. Res.* 40: 575-591.
- Martinho, V. and F. Pereira e Silva. 1982. Thermal calibration of satellite infrared images and correlation with sea-surface nutrient distribution. NTIS No. AD-A123 780/9.
- Mathieu, G.G. 1969. Radium and inorganic carbon in Antarctic waters. *Antarct. J. U.S.* 4: 186-187.
- Matsuura, N., M. Ishino and K. Otsuka. 1980. Finestructure of the second Oyashio intrusion. *J. Tokyo Univ. Fish.* 67: 45-54.
- Matsuura, N., T. Morinaga, J. Katoh, H. Sato, Y. Saotome, I. Kasuga, Y. Mine and A. Kitazawa. 1982. Oceanographic conditions of the Southern Ocean along 125 degrees east and 160 degrees east in the Austral summer of 1980-1981. *Trans. Tokyo Univ. Fish.* 0: 13-41.
- Maughan, P.M. and B.J. Culverhouse, Jr. 1970. Fisheries research vessel uses photos from satellite. *Ocean Ind.* 5: 45-46.
- Maughan, P.M., M.C. Ingham and J.F. Hebard. 1969. Feasibility of monitoring West African oceanic front from satellites. *Commer. Fish. Rev.* 31: 24-29.
- Maul, G.A. and H.R. Gordon. Relationships between ERTS radiances and gradients across oceanic fronts, p. 1279-1308. In 3rd Earth Resour. Technol. Satell. - 1 Symp. Vol. I: Tech. Presentations, Sect. B. NASA SP-351.
- Maul, G.A. and D.V. Hansen. 1972. An observation of the Gulf Stream surface front structure by ship, aircraft, and satellite. *Remote Sens. Environ.* 2: 109-116.
- McClain, C.R. 1985. Observations of Gulf Stream frontal upwellings. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- McClain, C.R., N.E. Huang and P.E. LaViolette. 1982. Measurements of sea-state variations across oceanic fronts using laser profilometry. *J. Phys. Oceanogr.* 12: 1228-1244.

- McClain, C.R., L.J. Pietrafesa and J.A. Yoder. 1984. Observations of Gulf Stream-induced and wind-driven upwelling in the Georgia Bight using ocean color and infrared imagery. *J. Geophys. Res.* 89: 3705-3723.
- McLeish, W. 1968. Small-scale structures in ocean fronts. *EOS, Trans. Am. Geophys. Union.* 49: 199.
- McRae, J.N. and J.J. McGann. 1965. Periodic fluctuations in wind, pressure and temperature at Port Hedland. *Aust. Meteorol. Mag.* 48: 1-7.
- Merkine, L. 1976. Energy integral description of the development of Kelvin-Helmholtz billows. *Tellus* 28: 197-214.
- Millard, R.C. 1976. Current structure and mixing in the shelf/slope water front south of New England. *J. Geophys. Res.* 81: 3695-3708.
- Miller, R.R., III. 1972. Current regime of the Maltese oceanic frontal zone. *U.S. Natl. Tech. Inf. Ser. Gov. Rep. Announce.* 72: 78.
- Millot, C. and L. Wald. 1980. Effect of Mistral wind on the Ligurian current near Provence. *Oceanol. Acta* 3: 399-402.
- Miranda, L.B. de, Y. Ikeda, B.M. de Castro Filho, et al. 1977. Note on the occurrence of saline fronts in the Ilha Grande (RJ) region. *Sao Paulo. Braz. Univ. Inst. Oceanogr. Bol.* 26: 249-256.
- Mooers, C.N.K. 1970. The interaction of an internal tide with the frontal zone of a coastal upwelling region. *Diss. Oreg. State Univ.*
- Mooers, C.N.K. 1977. Frontal dynamics and frontogenesis, p. 16-22. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes. Proc. Workshop held Mar. Sci. Res. Cent., May 25-27, 1977.* Springer-Verlag.
- Mooers, C.N.K. 1977. Some effects of oceanic fronts on near-inertial motions. *EOS, Trans. Am. Geophys. Union* 58: 893.
- Mooers, C.N.K. 1981. Coastally trapped waters, baroclinic eddies, internal tides and oceanic fronts at the shelf break: Their implications for exchanges between shelf and oceanic waters. *Phil. Trans. R. Soc. Lond.* A302: 661.
- Mooers, C.N.K., C.A. Collins and R.L. Smith. 1976. The dynamic structure of the frontal zone in the coastal upwelling region off Oregon. *J. Phys. Oceanogr.* 6: 3-21.
- Mooers, C.N.K., T.B. Curtin, D.P. Wang and J.F. Price. 1976. Bibliography for oceanic fronts and related topics: Special project from RSMAS. Univ. Miami, Fla.
- Mooers, C.N.K., C.N. Flagg and W.C. Boicourt. 1977. Prograde and retrograde fronts, p. 43-58. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes. Proc. Workshop held Mar. Sci. Res. Cent., May 25-27, 1977.* Springer-Verlag.

- Mooers, C.N.K., R.W. Garvine and W.W. Martin. 1979. Summertime synoptic variability of the Middle Atlantic shelf water/slope water front. *J. Geophys. Res.* 84: 4837-4854.
- Mooers, C.N.K., G.I. Roden, R.C. Beardsley, J.J. O'Brien, A. Leetma, M. Shapiro and T. Joyce. 1978. Oceanic fronts: A summary of a Chapman Conference. *EOS, Trans. Am. Geophys. Union* 59: 484-491.
- Mooers, C.N.K., A. Voorhis, R.J. Gibbs, T.M. Church, and L.V. Sick. 1979. Effects of circulation in Wilmington Canyon on biogeochemical distributions, 6 to 11 August 1978. In 42nd Annu. Meet. Am. Soc. Limnol. and Oceanogr., Inc. Abstr. pap.
- Moore, W.E. 1981. Effect of ocean fronts on the signal performance of deep towed hydrophone arrays. *Diss. Abstr. Int. Part B. Sci. and Eng.* 42.
- Moore, W.S. 1985. Radioisotope tracers and ocean fronts. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Morgan, C.W. and J.M. Bishop. 1977. An example of Gulf Stream eddy-induced water exchange in the Mid-Atlantic Bight. *J. Phys. Oceanogr.* 7: 472-479.
- Mork, M. 1981. Circulation phenomena and frontal dynamics of the Norwegian coastal current. *Phil. Trans. R. Soc. Lond.* A302: 635-647.
- Moseley, W., D. Del Balzo, J. Perkins, B. Adams and J. Bergin. 1979. Summary of FREDDEX developments prior to at-sea phase. *Nav. Res. Lab. Wash. D.C.* AD# A088672.
- Movchan, O.A. 1975. Phytoplankton distribution in the Scotia Sea south Atlantic Ocean as related to vertical water circulation. *Okeanologiya* 15: 708-712.
- Mulhearn, P.J. 1981. Real-time ocean-analysis off the N.S.W. Coast. *Bull. Aust. Oceanogr. Data Cent.* No. 15: 11-19.
- Murray-Prior, R. 1977. Aerial spotting for prawns in the Gulf. *Aust. Fish.* 36: 12-15.
- Nafpaktitis, B.G. 1978. Systematics and distribution of lanternfishes of the genera *Lobianchia* and *Diaphus* (Myctophidae) in the Indian Ocean. *Sci. Bull.* 30: 92.
- Nagata, Y. 1968. Shallow temperature inversions in the sea to the east of Honshu, Japan. *J. Oceanogr. Soc. Japan* 24: 17-28.
- Nagata, Y. 1979. Shallow temperature inversions in the Pacific Ocean near Japan. *J. Oceanogr. Soc. Japan* 35: 141-150.
- Namias, J. 1970. Macroscale variations in sea-surface temperatures in the North Pacific. *J. Geophys. Res.* 75: 565-582.
- Neubert, J.A. 1982. Mean multipath intensity relation for sound propagation through a random ocean front. *J. Acoust. Soc. Am.* 72: 222-225.

- Newton, C.W. 1961. Estimates of vertical motions and meridional heat exchange in Gulf Stream eddies, and a comparison with atmospheric disturbances. *J. Geophys. Res.* 66: 853-870.
- Newton, C.W. 1965. Semi-inertial velocity variations along the Gulf Stream axis. *Deep-Sea Res.* 12: 893-897.
- Newton, C.W. 1978. Fronts and wave disturbances in Gulf Stream and atmospheric jet stream. *J. Geophys. Res.* 83: 4697-4706.
- Nichol, D.G. 1978. Some automatic digital techniques for enhancing and extracting oceanic features from satellite infra-red pictures, p. 433-436. In *Oceans '78: The ocean challenge*. Proc. 4th Annu. MTS/IEEE Comb. Conf.
- Nihoul, J.C.J. 1980. *Marine turbulence*. vol. 28. Elsevier.
- Nihoul, J.C.J. 1981. Marine hydrodynamics at ecological scales, p. 1-12. In J.C.J. Nihoul [ed.], *Ecohydrodynamics*. Proc. 12th Int. Liege Colloq. Ocean Hydrodyn. Oceanogr. Ser. 32. Elsevier.
- Niiler, P.P. 1982. Fronts-80: A study of the North Pacific subtropical front. *Nav. Res. Rev.* 3: 41-50.
- Niiler, P.P. and R.W. Reynolds. 1984. The three-dimensional circulation near the eastern North Pacific subtropical front. *J. Phys. Oceanogr.* 14: 217-230.
- Nof, D. 1979. Generation of fronts by mixing and mutual intrusion. *J. Phys. Oceanogr.* 9: 298-310.
- Nowlin, W.D., Jr. and M. Clifford. 1982. The kinematic and thermohaline zonation of the Antarctic circumpolar current at Drake Passage. *J. Mar. Res.* 40: 481-507.
- Oakey, N.S. and J.A. Elliot. 1977. Vertical temperature gradient structure across the Gulf Stream. *J. Geophys. Res.* 82: 1369-1380.
- O'Brien, J.J. 1970. An annotated bibliography related to oceanic upwelling. Report for the Office of Naval Research.
- Officer, C.B. 1981. Physical dynamics of estuarine suspended sediments. *Mar. Geol.* 40: 1-14.
- Okubo, A. 1970. Horizontal dispersion of floatable particles in the vicinity of velocity singularities such as convergences. *Deep-Sea Res.* 17: 445-454.
- Okubo, A. 1977. Advection-diffusion in the presence of surface convergence, p. 23-28. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes*. Proc. Workshop held Mar. Sci. Res. Cent., May 25-27, 1977. Springer-Verlag.
- Olbers, D.J. 1981. A formal theory of internal wave scattering with applications to ocean fronts. *J. Phys. Oceanogr.* 11: 1078-1099.
- Olson, D.B., O.B. Brown and S.R. Emmerson. 1983. Gulf Stream frontal statistics from Florida Straits to Cape Hatteras derived from satellite and historical data. *J. Geophys. Res.* 88: 4569-4577.



- Olson, D.B. and T.W. Spence. 1978. Asymmetric disturbances in the frontal zone of a Gulf Stream ring. *J. Geophys. Res.* 83: 4691-4695.
- Oonishi, S. and S. Tanaka. 1981. Observation of front-laden and estimation of entrainment in two layer stratified estuaries. *Coast. Eng. Japan* 24: 243.
- Oonishi, Y., A. Harashima and H. Kunishi. 1978. Characteristics of a front formed by cooling of the sea surface and inflow of the fresh water. *J. Oceanogr. Soc. Japan* 34.
- Orlanski, I. and M.D. Cox. 1973. Baroclinic instability in ocean currents. *Geophys. Fluid Dyn.* 4: 297-332.
- Orr, J.C., N.L. Guinasso and D.R. Schink. 1985. Radon-222 surface water excesses: Indication of recent contact with shelf or slope sediments. In D.A. Wiesenberg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Orr, M.H. and F.R. Hess. 1978. Remote acoustic monitoring of natural suspensate distribution, active suspensate resuspension, and slope/shelf water intrusions. *J. Geophys. Res.* 83: 4062-4068.
- Ostapoff, F. 1962. On the frictionally induced transverse circulation of the Antarctic circumpolar current. *Deut. Hydrogr. Z.* 15: 103-113.
- Ostapoff, F. 1962. The salinity distribution at 200 meters and the Antarctic frontal zones. *Deut. Hydrogr. Z.* 15: 133-142.
- Ou, H.W. 1983. Some two-layer models of the shelf-slope front: Geostrophic adjustment and its maintenance. *J. Phys. Oceanogr.* 13: 1798-1808.
- Ou, H.W. 1984. Wind-driven motion near a shelf-slope front. *J. Phys. Oceanogr.* 14: 985-993.
- Ovchinnikov, V.V. 1966. The effect of oceanographic conditions on distribution of the sailfish, *Istiophorus americanus*, off the west African coast. *Oceanology* 6: 566-567.
- Owen, R.W. 1980. Eddies of the California current system: Physical and ecological characteristics, p. 237-263. In D. Power [ed.], *The California island: Proc. Multidisciplinary Symp.* Santa Barbara Mus. Nat. Hist.
- Owen, R.W. 1981. Fronts and eddies in the sea: Mechanisms, interactions and biological effects, p. 197-233. In A.R. Longhurst [ed.], *Analysis of marine ecosystems*. Academic Pr.
- Paffenhofer, G.-A. 1975. Hydrographic and biological observations at an anchor station off St. Augustine, Florida 9-14 April 1975 (Eastward cruise E-1G-75). *Ga. Univ. Mar. Sci. Cent., Skidaway Isl. Tech. Rep. Ser. No.* 77-4.
- Paffenhofer, G.-A. 1980. Zooplankton distribution as related to summer hydrographic conditions in Onslow Bay, North Carolina. *Bull. Mar. Sci.* 30: 819-832.

- Pak, H.J. 1985. Optical and particulate properties at oceanic fronts. In D.A. Wiesenburg and D.R. Kester [eds.], Chemical variability in ocean frontal areas -- workshop results. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Pak, H.J. and J.R.V. Zaneveld. 1974. Equatorial front in the eastern Pacific Ocean. J. Phys. Oceanogr. 4: 570-578.
- Paluszkiewicz, T., L.P. Atkinson, E.S. Posmentier and C.R. McClain. 1983. Observations of a loop current frontal eddy intrusion onto the West Florida shelf. J. Geophys. Res. 88: 9639-9651.
- Papez, A. 1972. Influence of frontal passages upon concentrations of SO<sub>2</sub> in Kopisty near Most. Hydrometeorol. Ustav 4: 173-180.
- Paquette, R.G. and R.H. Bourke. 1979. Temperature fine structure near the sea-ice margin of the Chukchi Sea. J. Geophys. Res. 84: 1155-1164.
- Paquette, R.G. and R.H. Bourke. 1981. Ocean circulation and fronts as related to ice melt-back in the Chukchi Sea. J. Geophys. Res. 86: 4215-4230.
- Parsons, T.R., R.I. Perry, E.D. Nutbrown, W. Hsieh and C.M. Lalli. 1983. Frontal zone analysis at the mouth of Saanich Inlet, British Columbia, Canada. Mar. Biol. 73: 1-5.
- Parsons, T.R., J. Stronach, G.A. Borstad, G. Louttit and R.I. Perry. 1981. Biological fronts in the Strait of Georgia, British Columbia, and their relation to recent measurements of primary productivity. Mar. Ecol. Prog. Ser. 6: 237-242.
- Pattullo, J.G. 1969. The subsurface front beneath the subtropical convergence in the northeast Pacific Ocean. EOS, Trans. Am. Union. 50: 194.
- Paulson, C.A., R.J. Baumann, L.M. Dewitt, T.J. Spoering and J.D. Wagner. 1980. Towed thermistor chain observations in FRONTS-80. Oreg. State Univ., Corvallis, Sch. Oceanogr. AD# A093674. Rep. No. DATA-85, REF-80-18.
- Paulson, C.A. and P.P. Niiler [eds.]. 1981. Fronts 80: Preliminary results from an investigation of the wintertime North Pacific subtropical front. Sch. Oceanogr. Oreg. State Univ. Tech Rep. 81-2.
- Perry, R.I., B.R. Dilke and T.R. Parsons. 1983. Tidal mixing and summer plankton distributions in Hecate Strait, British Columbia. Can. J. Fish. Aquat. Sci. 40: 871-887.
- Peterson, R.G., W.D. Nowlin, Jr. and T. Whitworth, III. 1982. Generation and evolution of a cyclonic ring at Drake Passage in early 1979. J. Phys. Oceanogr. 12: 712-719.
- Petterssen, S. 1936. Contribution to the theory of frontogenesis. Geof. Publ. 11.
- Petterssen, S. and J.M. Austin. 1942. Fronts and frontogenesis in relation to vorticity. Pap. Phys. Oceanogr. Met. M.I.T., WHOI 7: 1-37.

- Philpot, W. 1976. Application of LANDSAT-2 to the management of Delaware's marine and wetland resources. *Sci. Tech. Aerosp. Rep.* 14: 319.
- Pingree, R.D. 1975. The advance and retreat of the thermocline on the continental shelf. *J. Mar. Biol. Assoc. U.K.* 55: 965-974.
- Pingree, R.D. 1977. Phytoplankton growth and tidal fronts around British-Isles. *EOS, Trans. Am. Geophys. Union* 58: 889.
- Pingree, R.D. 1978. Cyclonic eddies and cross-frontal mixing. *J. Mar. Biol. Assoc. U.K.* 58: 955-963.
- Pingree, R.D. 1979. Baroclinic eddies bordering the Celtic Sea in late summer. *J. Mar. Biol. Assoc. U.K.* 59: 689-698.
- Pingree, R.D. 1979. Phytoplankton growth and cyclonic eddies. *Nature* 278: 245-247.
- Pingree, R.D. 1984. Some applications of remote sensing to studies in the Bay of Biscay, Celtic Sea and English Channel. In J.C.J. Nihoul [ed.], *Remote sensing of shelf sea hydrodynamics*. Elsevier.
- Pingree, R.D., M.J. Bowman and W.E. Esaias. 1978. Headland fronts, p. 78-86. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes: Proc. Workshop held Mar. Sci. Res. Cent., May 25-27, 1977*. Springer-Verlag.
- Pingree, R.D., G.R. Forster and G.K. Morrison. 1974. Turbulent convergent tidal fronts. *J. Mar. Biol. Assoc. U.K.* 54: 469-479.
- Pingree, R.D. and D.K. Griffiths. 1977. The bottom mixed layer on the continental shelf. *Estuarine Coastal Mar. Sci.* 5: 399-413.
- Pingree, R.D. and D.K. Griffiths. 1978. Tidal fronts on the shelf seas around the British Isles. *J. Geophys. Res.* 83: 4615-4622.
- Pingree, R.D. and D.K. Griffiths. 1980. Numerical model of the M-2 tide in the Gulf of St. Lawrence. *Oceanol. Acta* 3: 221-225.
- Pingree, R.D., D.K. Griffiths and G.T. Mardell. 1983. The structure of the internal tide at the Celtic Sea shelf break. *J. Mar. Biol. Assoc. U.K.* 64: 99-113.
- Pingree, R.D., P.M. Holligan and G.T. Mardell. 1978. The effects of vertical stability on phytoplankton distributions in the summer on the northwest European shelf. *Deep-Sea Res.* 25: 1011-1028.
- Pingree, R.D., P.M. Holligan and G.T. Mardell. 1979. Phytoplankton growth and cyclonic eddies. *Nature* 278: 245-247.
- Pingree, R.D., P.M. Holligan, G.T. Mardell and R.P. Harris. 1982. Vertical distribution of plankton in the Skagerrak in relation to doming of the seasonal thermocline. *Cont. Shelf Res.* 1: 209-219.
- Pingree, R.D., P.M. Holligan, G.T. Mardell and R.N. Head. 1976. The influence of physical stability on spring, summer and autumn phytoplankton blooms in the Celtic Sea. *J. Mar. Biol. Assoc. U.K.* 56: 845-873.

- Pingree, R.D. and G.T. Mardell. 1981. Slope turbulence, internal waves and phytoplankton growth at the Celtic Sea shelf-break. *Phil. Trans. R. Soc. Lond.* A302: 663-682.
- Pingree, R.D., G.T. Mardell, P.M. Holligan, D.K. Griffiths and J. Smithers. 1982. Celtic Sea and Armorican Current structure and the vertical distributions of temperature and chlorophyll. *Cont. Shelf. Res.* 1: 99-116.
- Pingree, R.D., G.T. Mardell and L. Maddock. 1983. A marginal front in Lyme Bay. *J. Mar. Biol. Assoc. U.K.* 63: 9-15.
- Pingree, R.D., P.R. Pugh, P.M. Holligan and G.R. Foster. 1975. Summer phytoplankton blooms and red tides along tidal fronts in the approaches to the English Channel. *Nature* 258: 672-677.
- Piton, B. and Y. Magnier. 1975. Remarques sur la circulation et les caracteristiques hydrologiques de la couche superficielle entre Madagascar et L'Equateur. *Cah. O.R.S.T.O.M. Ser. Oceanogr.* 13: 117-132.
- Pomeroy, L.R., L.P. Atkinson, J.O. Blanton, W.B. Campbell, T.R. Jacobsen, K.H. Kerrick and A.M. Wood. 1983. Microbial distribution and abundance in response to physical and biological processes on the continental shelf of southeastern U.S.A. *Cont. Shelf Res.* 2: 1-20.
- Popkov, V.V. 1983. The position of frontal zones and distribution of krill in the Pacific sector of the Antarctic regions, p. 66-73. In T.G. Lyubimova, Antarctic krill: Distribution pattern and environment. *Legkaya I Pishchevaya I Promyshlennost*, Moscow.
- Posmentier, E.S. and R.W. Houghton. 1978. Fine structure instabilities induced by double diffusion in the shelf/slope water front. *J. Geophys. Res.* 83: 5135-5138.
- Posmentier, E.S. and R.W. Houghton. 1981. Springtime evolution of the New England shelf break front. *J. Geophys. Res.* 86: 4253-4259.
- Powers, K.D., G.L. Pittman and S.J. Fitch. 1980. Distribution of marine birds on the mid- and north-Atlantic U.S. outer continental shelf. *Tech. Prog. Rep.*, January 1978-July 1980. NTIS. DOE/EV/ 04706-7.
- Ramp, S.R., R.C. Beardsley and R. Legeckis. 1983. An observation of frontal wave development on a shelf-slope/warm core ring front near the shelf break south of New England. *J. Phys. Oceanogr.* 13: 907-912.
- Rao, D.B. and J. Simons. 1970. Stability of a sloping interface in a rotating two-fluid system. *Tellus* 12: 493-503.
- Rao, G.V. and W.S. Murty. 1973. Some case studies of vertical circulations associated with oceanic fronts. *J. Geophys. Res.* 78: 549-557.
- Reid, J.L., Jr., G.I. Roden and J.G. Wyllie. 1958. Studies of the California current system. *Calif. Coop. Oceanic Fish. Invest. Prog. Rep.*, July 1956-Jan. 1958: 27-56.



- Reid, P.C. 1978. Dinoflagellate cysts in the plankton. *New Phytol.* 80: 219-229.
- Reid, P.C., H.G. Hunt and T.D. Jonas. 1983. Exceptional blooms of diatoms associated with anomalous hydrographic conditions in the Southern Bight in early 1977. *J. Plankton Res.* 5: 755-765.
- Renard, R.J. 1970. Hyperbaroclinic zones: Numerical analysis and application to fronts. U.S. Nav. Postgrad. Sch. Rept., 196 pp., NPS-51RD0031A, Monterey, CA.
- Richards, K.J. 1983. Benthic boundary layer - IOS modelling programme: Interim report, March 1983. Ocean disposal of high level radioactive waste. A research report prepared for the Department of the Environment. Rep. Inst. Oceanogr. Sci. Wormley. No. 162.
- Riley, G.A. 1937. The significance of the Mississippi River drainage for biological conditions in the northern Gulf of Mexico. *J. Mar. Res.* 1: 60-74.
- Ring Group, The. 1981. Gulf Stream cold-core rings: Their physics, chemistry, and biology. *Science* 212: 1091-1100.
- Roberts, P.E. 1980. Surface distribution of Albacore tuna, *Thunnus alalunga* Bonnaterre, in relation to the subtropical convergence zone east of New Zealand. *N.Z. J. Mar. Freshw. Res.* 14: 373-380.
- Robertson, D.A., P.E. Roberts, J.B. Wilson. 1978. Mesopelagic faunal transition across the subtropical convergence east of New Zealand. *N.Z. J. Mar. Freshw. Res.* 12: 295-312.
- Robinson, M.K. 1970. Evidence of subtropical countercurrents east of Hawaii indicated by monthly thermocline topographies derived from bathythermograph data. In *Phys. Oceanogr. (III)*, 144. Int. Assoc. Phys. Sci. Ocean. 15th Gen. Assem., Sept. 13-25, 1970. Sci. Council. Japan.
- Robinson, M.K. 1976. Atlas of north Pacific Ocean monthly mean temperatures and mean salinities of the surface layer. Dept. Navy #RP-2.
- Roden, G.I. 1970. Aspects of the mid-Pacific transition zone. *J. Geophys. Res.* 75: 1097-1109.
- Roden, G.I. 1971. Aspects of the transition zone in the northeastern Pacific. *J. Geophys. Res.* 76: 3462-3475.
- Roden, G.I. 1971. Spectra of North Pacific and salinity perturbations in the depth domain. *J. Phys. Oceanogr.* 1: 25-33.
- Roden, G.I. 1972. Temperature and salinity fronts at the boundaries of the subarctic-subtropical transition zone in the western Pacific. *J. Geophys. Res.* 77: 7175-7187.
- Roden, G.I. 1972. Thermohaline structure and baroclinic flow across the Gulf of California entrance and in the Revilla Gigedo Islands region. *J. Phys. Oceanogr.* 2: 177-183.

- Roden, G.I. 1974. Thermohaline structure fronts, and sea-air energy exchange of the trade wind region east of Hawaii. *J. Phys. Oceanogr.* 4: 168-182.
- Roden, G.I. 1975. On North Pacific temperature, salinity, sound velocity, and density fronts and their relation to the wind and energy flux fields. *J. Phys. Oceanogr.* 5: 557-571.
- Roden, G.I. 1976. On the structure and prediction of oceanic fronts. *Nav. Res. Rev.* 29: 18-35.
- Roden, G.I. 1977. Meso and large-scale fronts of the Pacific. *EOS, Trans. Am. Geophys. Union* 58: 885.
- Roden, G.I. 1977. Oceanic subarctic fronts of the central Pacific: Structure of and response to atmospheric forcing. *J. Phys. Oceanogr.* 7: 761-778.
- Roden, G.I. 1978. On the depth variability of mesoscale thermohaline gradients in the western Pacific. *EOS, Trans. Am. Geophys. Union* 59: 1109.
- Roden, G.I. 1979. The depth variability of meridional gradients of temperature, salinity and sound velocity in the western North Pacific. *J. Phys. Oceanogr.* 9: 756-767.
- Roden, G.I. 1980. FRONTS expedition CTD data report 15 January - 16 February 1980. Tech. Rep. 384. Univ. of Wash., Seattle.
- Roden, G.I. 1980. On the subtropical frontal zone north of Hawaii during winter. *J. Phys. Oceanogr.* 10: 342-362.
- Roden, G.I. 1980. On the variability of surface temperature fronts in the western Pacific, as detected by satellite. *J. Geophys. Res.* 85: 2704-2710.
- Roden, G.I. 1981. Mesoscale thermohaline, sound velocity and baroclinic flow structure of the Pacific subtropical front during the winter of 1980. *J. Phys. Oceanogr.* 2: 658-675.
- Roden, G.I. 1985. Mesoscale sound speed fronts in the central and western North Pacific and in the Emperor Seamounts region. (in press).
- Roden, G.I. and D.F. Paskausky. 1978. Estimation of rates of frontogenesis and frontolysis in the North Pacific Ocean using satellite and surface meteorological data from January 1977. *J. Geophys. Res.* 83: 4545-4550.
- Rosowski, M.C. 1979. The effect of temperature on growth and dispersal of larvae of *Geryon quinquedens* Smith (Brachyura: Geryonidae). In 42nd Annu. Meet. Am. Soc. Limnol. Oceanogr. Abstr. pap. Stony Brook, N.Y. Jun.18-21, 1979.
- Rossby, C.G. 1951. On the vertical and horizontal concentration of momentum in air and ocean currents. *Tellus* 3: 15-27.
- Rossov, V.V. and A.G. Kislyakov. 1972. The polar front in the North Atlantic in 1968-1969, p. 220-226. In International Council for the Exploration of the Sea. Rapp. P.-V. Reun. 162.

- Rotschi, H., P. Hisard and P. Rual. 1968. Observation de deux fronts thermiques dans le Pacifique Equatorial Occidental. Acad. Sci. Paris. C.R. Ser. B. Sci. Math. 266: 1465-1468.
- Rouse, L.J., A.P. Cracknell, P.Y. Deschamps, R.E. Dugdale, E.C. Monahan, J.H. Simpson, C. Tomassini, S. Ueno, J.F. Vernberg and J.P. Diemer [eds.]. 1982. Comparative study of remote sensing observations and coastal processes in different geographic areas, p. 511-516. In Processes in marine remote sensing. Univ. South Carolina Pr.
- Royal Society of London. 1981. Circulation and fronts in continental shelf seas. Cambridge Univ. Press.
- Ruddick, B.R. and J.S Turner. 1979. The vertical length scale of double-diffusive intrusions. Deep-Sea Res. 26: 903-913.
- Ruijter, W.P.M. De. 1983. Effects of velocity shear in advective mixed layer models. J. Phys. Oceanogr. 13: 1589-1599.
- Ruijter, W.P.M. De. 1983. Frontogenesis in an advective mixed-layer model. J. Phys. Oceanogr. 13: 487-495.
- Sackett, W.M., B.J. Eadie and M.E. Exner. 1974. Stable isotope composition of organic carbon in recent Antarctic sediments, p. 661-671. In Advances in organic geochemistry: 1973, Editions Tech. Paris.
- Saltzman, B. and C.-M. Tang. 1975. Formation of meanders, fronts, and cutoff thermal pools in a baroclinic ocean current. J. Phys. Oceanogr. 5: 86-92.
- Sancetta, C. 1979. Oceanography of the North Pacific during the last 18,000 years: Evidence from fossil diatoms. Mar. Micropaleontol. 4: 103-123.
- Sarynina, R.N. 1972. Conditions of origin of cold deep-sea waters in the Bear Island Channel. In International Council for the Exploration of the Sea. Charlottenlund Slot, Den. Rapp. P.-V. Reun. 162: 7-12, Oct. 1972.
- Saur, J.F.T. 1980. Surface salinity and temperature on the San Francisco-Honolulu route June 1966-December 1970 and January 1972-December 1975. J. Phys. Oceanogr. 10: 1669-1680.
- Sauskan, E.M. 1972. Current variations as observed at multi-diurnal stations in the Atlantic Ocean. In International Council for the Exploration of the Sea. Charlottenlund Slot, Den. Rapp. P.-V. Reun. 162: 7-12, Oct. 1972.
- Savidge, G. 1976. A preliminary study of the distribution of chlorophyll in the vicinity of fronts in the Celtic and western Irish Seas. Estuarine, Coastal Mar. Sci. 4: 617-625.
- Savidge, G. and P. Foster. 1978. Phytoplankton biology of a thermal front in the Celtic Sea. Nature 271: 155-157.
- Scarpace, F.L. and T. Green, III. 1973. Dynamic surface temperature structure of thermal plumes. Water Resour. Res. 9: 138-153.

- Schmitz, J. and A.C. Vastano. 1976. Acoustic effects of fronts in the western North Atlantic Ocean. *Sci. Tech. Aerosp. Rep.* 14: 91.
- Schneider, D.C. 1982. Fronts and seabird aggregations in the southeastern Bering Sea. *Mar. Ecol. Prog. Ser.* 10: 101-103.
- Schneider, D.C. and G.L. Hunt. 1982. Carbon flux to seabirds in waters with different mixing regimes in the southeastern Bering Sea. *Mar. Biol.* 67: 337-344.
- Schneider, D.C., G.L. Hunt, Jr. and N.M. Harrison. 1985. Mass and energy transfer to seabirds in the southeastern Bering Sea. *Cont. Shelf Res.* (in press).
- Schneider, D.C., G.L. Hunt, Jr. and N.M. Harrison. 1985. Transient responses of seabirds to fronts in the southeastern Bering Sea. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results.* NORDA Rep. 78. *Nav. Ocean Res. and Dev. Act.* NSTL, Miss.
- Schneider, D.C., G.L. Hunt, Jr. and K.D. Powers. 1985. Energy flux to pelagic birds: A comparison of Bristol Bay and Georges Bank. In J.P. Crowell [ed.], *Seabird feeding ecology.* Cambridge Univ. Pr. (in press).
- Schumacher, J.D., T.H. Kinder, D.J. Pashinski and R.L. Charnell. 1979. A structural front over the continental shelf of the eastern Bering Sea. *J. Phys. Oceanogr.* 9: 79-87.
- Schumann, E.H. 1983. Mesoscale physical processes on continental shelf, p. H. II. In 5th Natl. Oceanogr. Symp. 24-28 Jan. 1983. Rhodes Univ. Grahamstown. Abstr.
- Sciremammano, F., R.D. Pillsbury, W.K. Nowlin and T. Whitworth. 1980. Spatial scales of temperature and flow in Drake Passage. *J. Geophys. Res.* 85: 4015-4028.
- Seliger, H.H., K.R. McKinley, W.H. Biggley, R.B. Rivkin and K.R.H. Aspden. 1981. Phytoplankton patchiness and frontal regions. *Mar. Biol.* 61: 119-131.
- Seliger, H.H., R.B. Rivkin, W.H. Biggley and K.R. Hickman. 1979. Estuarine flow fronts and their biological consequences. In 42nd Annu. Meet. Am. Soc. Limnol. Oceanogr. Abstr. pap. Stony Brook, N.Y. Jun. 18-21, 1979.
- Seliger, H.H., M.A. Tyler and K.R. McKinley. 1978. Phytoplankton distributions and red tides resulting from frontal circulation patterns, p. 239-247. In D.L. Taylor and H.H. Seliger [eds.], *Toxic dinoflagellate blooms.* Proc. 2nd Int. Conf. Toxic Dinoflagellate Blooms. Key Biscayne, Fla., Oct. 31 - Nov. 5, 1978. *Dev. Mar. Biol.* vol. 1.
- Semenov, V.N. and I.S. Berman. 1977. Biogeographic aspects of the distribution and dynamics of water masses off the South American coast. *Oceanology* 17: 710-718.
- Shores, D.L. 1969. Mesopelagic fishes and thermal fronts in the western Sargasso Sea. *Mar. Biol.* 3: 87-106.
- Shuntov, V.P., D.F. Kirlan, L.V. Batyskaya, S.Yu. Glebova and N.G. Kolesova. 1983. Areas of accumulations of different groups of birds, their interannual variability and abundance in the Southern Ocean. *Sov. J. Mar. Biol.* 8: 119-127.



- Shuntov, V.P., D.F. Kirlan, L.V. Batytskaya, S.Yu. Glebova and N.G. Kolesova. 1983. General patterns of the quantitative distribution of seabirds in the Southern Ocean. *Sov. J. Mar. Biol.* 8: 49-56.
- Sick, L.V. and C.C. Johnson. 1978. Trace metal enhancement in the biotic and abiotic components of an estuarine tidal front. *J. Geophys. Res.* 83: 4659-4667.
- Sievers, H.A. and W.J. Emery. 1978. Variability of the Antarctic polar frontal zone in the Drake Passage - summer 1976-1977. *J. Geophys. Res.* 83: 3010-3022.
- Simpson, J.H. 1971. Density stratification and microstructure in the western Irish Sea. *Deep-Sea Res.* 18: 309-319.
- Simpson, J.H. 1976. A boundary front in the summer regime of the Celtic Sea. *Estuarine Coastal Mar. Sci.* 4: 71-81.
- Simpson, J.H. 1977. Fronts on continental-shelf. *EOS, Trans. Am. Geophys. Union* 58: 887.
- Simpson, J.H. 1981. The shelf-sea fronts: Implications of their existence and behaviour. *Phil. Trans. R. Soc. Lond.* A302: 531-546.
- Simpson, J.H., C.M. Allen and N.C.G. Morris. 1978. Fronts on the continental shelf. *J. Geophys. Res.* 83: 4607-4614.
- Simpson, J.H. and D.C. Bowers. 1979. Shelf sea fronts' adjustments revealed by satellite IR imagery. *Nature* 280: 648-651.
- Simpson, J.H. and D.C. Bowers. 1981. Models of stratification and frontal movement in shelf seas. *Deep-Sea Res.* 28: 727-738.
- Simpson, J.H., D.C. Bowers, J.F. Vernberg and J.P. Diemer [eds.]. 1982. On the use of infra-red imagery to study the surface temperature of the shelf seas, p.335-349. In *Processes in marine remote sensing*. Univ. South Carolina Pr.
- Simpson, J.H., D.J. Edelsten, A. Edwards, N.C.G. Morris and P.B. Tett. 1979. The Islay Front: Physical structure and phytoplankton distribution. *Estuarine Coastal Mar. Sci.* 9: 713-726.
- Simpson, J.H., D.G. Hughes and N.C.G. Morris. 1977. The relation of seasonal stratification to tidal mixing on the continental shelf, p. 327-340. In M. Angel [ed.], *A voyage of discovery*. Pergamon.
- Simpson, J.H. and J.R. Hunter. 1974. Fronts in the Irish Sea. *Nature* 250: 404-406.
- Simpson, J.H. and R.A. Nunes. 1981. The tidal intrusion front: An estuarine convergence zone. *Estuarine Coastal Shelf Sci.* 13: 257-266.
- Simpson, J.H. and R.D. Pingree. 1977. Shallow sea fronts produced by tidal stirring, p. 29-42. In M.J. Bowman and W.E. Esaias [eds.], *Oceanic fronts in coastal processes*. *Proc. Workshop Mar. Sci. Res. Cent.*, May 25-27, 1977. Springer-Verlag.

- Simpson, J.H., P.B. Tett, M.L. Argote-Espinoza, A. Edwards, K.J. Jones and G. Savidge. 1982. Mixing and phytoplankton growth around an island in a stratified sea. *Cont. Shelf Res.* 1: 15-31.
- Singer, J.J., L.P. Atkinson, W.S. Chandler, et al. 1977. Hydrographic observations in Onslow Bay, North Carolina (July-August 1976/Obis V): Data graphics. Ga. Univ. Mar. Sci. Cent., Skidaway Isl. Tech. Rep. Ser. 77-6.
- Small, L.F., T.B. Curtin and C.N.K. Mooers. 1977. Chlorophyll patterns in coastal upwelling frontal zone off Oregon under transient wind conditions. *EOS, Trans. Am. Geophys. Union* 58: 889.
- Smart, J.H. 1984. Spatial variability of major frontal systems in the North Atlantic-Norwegian Sea area: 1980-81. *J. Phys. Oceanogr.* 14: 185-192.
- Smith, E.L. 1967. A predictive horizontal-temperature-gradient model of the upper 750 feet of the ocean. *Nav. Elec. Lab. Tech. Rep.* 1445.
- Smith, P.C. 1978. Low-frequency fluxes of momentum, heat, salt, and nutrients at the edge of the Scotian Shelf. *J. Geophys. Res.* 83: 4079-4096.
- Sommerhoff, G. 1974. Oceanic polar front of the east Greenland Current and its dependence upon submarine topography. *Deutsche Hydrogr. Z.* 27: 114-121.
- Sournia, A., J.-R. Grall and G. Jacques. 1979. Diatomees et dinoflagelles planctoniques d'une coupe meridienne dans le sud de l' ocean Indien (campagne Antiprod I du Marion-Dufresne, Mars 1977). Plankton diatoms and dinoflagellates along a meridian transect in the southern Indian Ocean (cruise Antiprod I of R/V Marion-Dufresne, March 1977). *Bot. Mar.* 22: 183-198.
- Special Research Project on Environmental Science. 1984. A review of the studies on the coastal currents relating to dispersion and transport in the waters around Japan. *Minist. Educ., Cult. Sci., Japan. Rep.* B224-5806.
- Stabeno, P.J. 1982. The reflection, transmission and scattering of internal waves at ocean fronts. *Ph.D. Diss., Oregon State Univ., Corvallis, Oregon.* 141 p.
- Stanton, B.R. 1969. Hydrological observations across the tropical convergence north of New Zealand. *N.Z. J. Mar. Freshw. Res.* 3: 124-146.
- Stanton, B.R. 1975. Vertical structure in the mid-Tasman Convergence Zone. *N.Z. J. Mar. Freshw. Res.* 9: 63-74.
- Stanton, B.R. 1976. An oceanic frontal jet near the Norfolk Ridge northwest of New Zealand. *Deep-Sea Res.* 23: 821-829.
- Stanton, B.R. 1979. The Tasman Front. *N.Z. J. Mar. Freshw. Res.* 13: 201-214.
- Stanton, B.R. 1981. An oceanographic survey of the Tasman Front. *N.Z. J. Mar. Freshw. Res.* 15: 289-297.
- Stefan, H. and P. Vaidyaraman. 1972. Jet type model for the three-dimensional thermal plume in a crosscurrent and under wind. *Water Resour. Res.* 8: 998-1014.

- Stefansson, U. 1972. Near-shore fluctuations of the frontal zone southeast of Iceland, p. 201-205. In International Council for the Exploration of the Sea. Charlottenlund Slot, Den. Rapp. P.-V. Reun. 162: 7-12, Oct. 1972.
- Stefansson, U., L.P. Atkinson and D.F. Bumpus. 1971. Hydrographic properties and circulation of the North Carolina shelf and slope waters. Deep-Sea Res. 18: 383-420.
- Stern, M.E., H.J. Freeland, D.M. Farmer and C.D. Levings [eds.]. 1980. Geostrophic fronts, p. 181-189. In Fjord oceanography. Plenum Pr.
- Stern, M.E. and F.K. Mellor [eds.]. 1983. Baroclinic instability and ocean fronts. Summer study program in geophysical fluid dynamics. Woods Hole Oceanogr. Inst. Rep. WHOI-83-41.
- Stevenson, M.R. 1968. Preliminary results and data report from EASTROPAC-2 Cruise. Ecuador, Inst. Nac. Depesca. Guayaquil Inter-American Tropical Tuna Comm. La Jolla, Calif. Rep. No. 81.
- Stevenson, M.R. 1973. Application of high resolution infrared and visual data to investigate changes in and the relationship between sea surface temperatures and cloud patterns over the eastern tropical Pacific. In Inter-American Tropical Tuna Commission. Final rep. June 1973.
- Stevenson, M.R. 1974. Application of satellite data to study oceanic fronts in the eastern Pacific. In Inter-American Tropical Tuna Comm. La Jolla, Calif. Final rep. May 1974.
- Stevenson, M.R., R.W. Garvine and B. Wyatt. 1974. Lagrangian measurements in a coastal upwelling zone off Oregon. J. Phys. Oceanogr. 4: 321-336.
- Stigebrandt, A. and J.C.J. Nihoul [ed.]. 1981. Cross thermocline flow on continental shelves and the locations of shelf fronts, p. 51-66. In Ecohydrodynamics. Elsevier Oceanogr. Ser. vol. 32, Elsevier Sci. Pub. Co.
- Stommel, H. 1953. Examples of the possible role of inertia and stratification in the dynamics of the Gulf Stream system. J. Mar. Res. 12: 184-195.
- Streeter, S.S. and N.U. Shackleton. 1979. Paleo circulation of the deep North Atlantic 150000 year record of benthic foraminifera and oxygen-18. Science 203: 168-171.
- Stross, R.G., C. Patton and C.P. McRoy. 1979. Nitrate limited photosynthesis between Bering Sea fronts: Whole cycle analysis. In 42nd Annu. Meet. Am. Soc. Limnol. Oceanogr. Abstr. pap. Stony Brook, N.Y. Jun. 18-21, 1979.
- Sturtevant, B. 1965. Implications of experiments on the weak undular bore. Phys. Fluids 8: 1052-1055.
- Swallow, J.C., R.I. Currie, A.E. Gill and J.H. Simpson. 1981. Circulation and fronts in continental-shelf seas - introductory-remarks. Phil. Trans. R. Soc. Lond. Ser. A - Math. 302: 513.

- Swift, J.H. and K. Aagaard. 1981. Seasonal transitions and water mass formation in the Iceland and Greenland Seas. *Deep-Sea Res.* 28: 1107-1129.
- Szekiela, K.-H., S.L. Kupperman, V. Klemas and D.F. Polis. 1972. Element enrichment in organic films and foam associated with aquatic frontal systems. *J. Geophys. Res.* 77: 5278-5282.
- Tabata, S. and L.F. Giovando. 1963. The seasonal thermocline at ocean weather station 'P' during 1956 through 1959. *Manus. Rep. Ser. No. 157. Fish. Res. Bd. Can.*
- Tabata, S. and J.F.R. Gower. 1980. Comparison of ship and satellite measurements of sea surface temperatures off the Pacific Coast of Canada. *J. Geophys. Res.* 85: 6636-6648.
- Tang, C.L. 1983. Cross-front mixing and frontal upwelling in a controlled quasi-permanent density front in the Gulf of St. Lawrence. *J. Phys. Oceanogr.* 13: 1468-1481.
- Tanimura, A. 1981. Distribution of the surface chlorophyll a along the course of the ice breaker Fuji to and from Antarctica in 1979-1980. *Antarct. Rec.* 0: 35-48.
- Taylor, H.W., A.L. Gordon and E. Molinelli. 1978. Climatic characteristics of the Antarctic Polar Front Zone. *J. Geophys. Res.* 83: 4572-4578.
- Tett, P. 1981. Modelling phytoplankton production at shelf-sea fronts. *Phil. Trans. R. Soc. Lond.* A302: 605-615.
- Thompson, J.D. 1974. The coastal upwelling cycle on a beta-plane, hydrodynamics and thermodynamics. *Mesoscale Air-Sea Interaction Group Tech. Rep. Fla. State Univ.*
- Thompson, P.R. and N.J. Shackleton. 1980. North Pacific paleoceanography: Late quaternary coiling variations of planktonic foraminifer *Neoglobobulimina pachyderma*. *Nature* 287: 829-833.
- Thompson, R.O.R.Y. and R.J. Edwards. 1981. Mixing and water-mass formation in the Australian Subantarctic. *J. Phys. Oceanogr.* 11: 1399-1406.
- Thomson, R.E. and L.S.C. Kuwahara. 1981. Detecting temperature fine structure and mesoscale frontal regimes along line P in the northeastern Pacific Ocean. *Can. J. Fish. Aquat. Sci.* 38: 40-51.
- Thorpe, S.A. 1983. Benthic observations on the Madeira Abyssal Plain: Fronts. *J. Phys. Oceanogr.* 13: 1430-1440.
- Thorpe, S.A., A.J. Hall and S. Hunt. 1983. Bouncing internal bores of Ardmucknish Bay, Scotland. *Nature* 306: 167-169.
- Tibbs, J.F. 1965. Observations on *Gigantocypris*, Crustacea-Ostracoda, in the Antarctic Ocean. *Limnol. Oceanogr.* 10: 480-482.
- Timonin, A.G. 1969. The structure of pelagic associations. The quantitative relationship between different trophic groups of plankton in frontal zones of the Tropical Ocean. *Oceanology* 9: 686-695.



- Tomczak, M., Jr. 1977. Continuous measurement of near-surface temperature and salinity in the NW African upwelling region between Canary Islands and Cap Verde during the winter of 1971-1972. *Deep-Sea Res.* 24: 1103-1119.
- Tomczak, M., Jr. 1981. A multi-parameter extension of temperature/salinity diagram techniques for the analysis of non-isopycnal mixing. *Prog. Oceanogr.* 10: 147-171.
- Tomczak, M. 1981. Analysis of mixing in the frontal zone of south and north Atlantic central water off north-west Africa. *Prog. Oceanogr.* 10: 173-192.
- Tomczak, M., Jr. 1983. Water masses in east Australian current eddy H. CSIRO Mar. Lab. Rep. 161. Commonw. Sci. Ind. Res. Organ. Mar. Lab. Cronulla, Aust.
- Tomczak, M., Jr. and G. Miosaa. 1976. The sea surface temperature as detected by airborne radiometer in the upwelling region off Cap Blanc, NW-Africa. "Meteor" *Forschungsergeb.* 17: 1-20.
- Tomosada, A. 1978. A large warm eddy detached from the Kuroshio east of Japan. *Tokai-Ku Suisan Kenkkyujo.* Tokyo 94: 59-103.
- Toole, J.M. 1981. Anomalous characteristics of equatorial thermohaline finestructure. *J. Phys. Oceanogr.* 11: 871-876.
- Toole, J.M. and D.T. Georgi. 1981. On the dynamics and effects of double-diffusively driven intrusions. *Prog. Oceanogr.* 10: 123-145.
- Traganza, E.D. 1985. Satellite oceanography and chemical fronts in the California current and coastal upwelling zone. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results.* NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Tranter, D.J., G.S. Leech and D. Airey. 1983. Edge enrichment in an ocean eddy. *Aust. J. Mar. Freshw. Res.* 34: 665-680.
- Trees, C.C., T.J. Frank, M.C. Kennicutt, II, J.M. Brooks and G.J. Denoux. 1985. HPLC measured chlorophyll at ocean frontal areas. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results.* NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Turner, J.T. and M.J. Dagg. 1983. Vertical distributions of continental shelf zooplankton in stratified and isothermal waters. *Biol. Oceanogr.* 3: 1-40.
- Turpaeva, E.P. and A.D. Yampolsky. 1979. On a possibility of detecting upwellings with the aid of oceanic fouling. *Okeanologiya* 19: 1116-1124.
- Tyler, M.A., D.W. Coats and D.M. Anderson. 1982. Encystment in a dynamic environment: Deposition of dinoflagellate cysts by a frontal convergence. *Mar. Ecol. Prog. Ser.* 7: 163-178.
- Tyler, M.A. and W. Philpot. 1979. The frontal interface as a biological transfer zone. In 42nd Annu. Meet. Am. Soc. Limnol. Oceanogr. Inc. Abstr. pap. Stony Brook, N.Y. Jun. 18-21, 1979.

- Uda, M. 1938. Research on 'siome' or current rip in the seas and oceans. *Geophys. Mag.* 11: 307-372.
- Uda, M. 1952. On the relation between the variation of the important fish conditions and oceanographic conditions in the adjacent waters of Japan. *J. Tokyo Univ. Fish.* 38: 363-389.
- Uda, M. 1959. Water mass boundaries--"siome." Frontal theory in oceanography. *Fish. Res. Bd. Can. Manuscr. Rep. Ser. No. 51. Semin.* 2: 10-20.
- Uda, M. 1970. Fishery oceanographic studies of frontal eddies and transport associated with the Kuroshio system including the "Subtropical Countercurrent." In J.C. Marr [ed.], *The Kuroshio: A symposium on the Japan Current.* East-West Center Press, Honolulu.
- Uda, M. 1973. Pulsative fluctuation of oceanic fronts in association with the tuna fishing grounds and fisheries. *J. Fac. Mar. Sci. Technol., Tokai Univ.* 7: 245-265.
- Ul'yanova, V.I. 1972. Baroclinic instability in Kochin's two-layer model of a frontal wave on the beta plane. *Akad. Nauk SSSR. Bull. Atmos. Oceanic Phys. Ser.* 8: 79-84.
- Uribe, E., S. Neshyba and T. Fonseca. 1982. Phytoplankton community composition across the west wind drift off South America. *Deep-Sea Res.* 29: 1229-1243.
- Valadimirov, O.A. 1965. Construction and appraisal of charts of isotherms and isohalines. *Gos. Okeanogr. Inst. Trud.* 87: 105-114.
- Valentine, H.R. and J.R.E. Lutjeharms. 1983. Historic position of the Southern Ocean front, p. D 5. In 5th Natl. Oceanogr. Symp. 24-28 Jan. 1983. Rhodes Univ. Grahamstown. Abstr.
- van Aken, H.M. 1982. The density ratio of frontal intrusions in the North Rockall Trough. *J. Phys. Oceanogr.* 12: 1318-1323.
- Van Woert, M.L. 1981. Satellite observations in FRONTS 80. Scripps Inst. Oceanogr. La Jolla, Calif. AD# A111080. Rep. No. SIO-REF-81- 38.
- Van Woert, M.L. 1982. The subtropical front: Satellite observations during FRONTS 80. *J. Geophys. Res.* 87: 9523-9536.
- Vastano, A.C. 1984. Mesoscale features along the first Oyashio Intrusion. *J. Geophys. Res.* 89: 587-596.
- Vastano, A.C., D.B. Olson and J.A. Vastano. 1981. The acoustic environment of ring BOB. *J. Acoust. Soc. Am.* 70: 1728-1735.
- Vecchione, M. and G.C. Grant. 1983. A multivariate analysis of planktonic molluscan distribution in the Middle Atlantic Bight. *Cont. Shelf Res.* 1: 405-424.
- Vesecky, J.F. and R.H. Stewart. 1982. The observation of ocean surface phenomena using imagery from the SEASAT synthetic aperture radar: An assessment. *J. Geophys. Res.* 87: 3397-3430.

- Viollier, M., P.Y. Deschamps and P. Lecomte. 1978. Airborne remote sensing of chlorophyll content under cloudy sky as applied to the tropical waters in the Gulf of Guinea. *Remote Sens. Environ.* 7: 235-248.
- Von Arx, W.S., D.F. Bumpus and W.S. Richardson. 1953. On the fine-structure of the Gulf Stream front. *Deep-Sea Res.* 3: 46-65.
- Voorhis, A.D. 1964. Oceanic thermal fronts in the Sargasso Sea. *J. Geophys. Res.* 69: 3809-3814.
- Voorhis, A.D. 1969. The horizontal extent and persistence of thermal fronts in the Sargasso Sea. *Deep-Sea Res.* 16: 331-337.
- Voorhis, A.D. and J.G. Bruce. 1982. Small-scale surface stirring and frontogenesis in the subtropical convergence of the western North Atlantic. *J. Mar. Res.* 40: 801-821.
- Voorhis, A.D., E.H. Schroeder and A. Leetmaa. 1976. The influence of deep mesoscale eddies on sea surface properties in the North Atlantic subtropical convergence. *J. Phys. Oceanogr.* 6: 953-961.
- Voorhis, A.D., D.C. Webb and R.C. Millard. 1976. Current structure and mixing in the shelf/slope water front south of New England. *J. Geophys. Res.* 81: 3695-3708.
- Vukovich, F.M., B.W. Crissman, M. Bushnell and W.J. King. 1979. Some aspects of the oceanography of the Gulf of Mexico using satellite and in situ data. *J. Geophys. Res.* 84: 7749-7768.
- Wadhams, P., A.E. Gill and P.F. Linden. 1979. Transects by submarine of the East Greenland Polar Front. *Deep-Sea Res.* 26: 1311-1327.
- Waldrop, W.R. and R.C. Farmer. 1974. Three-dimensional computation of buoyant plumes. *J. Geophys. Res.* 79: 1269-1276.
- Wallace, E.C. 1979. A study of the oceanographic environment of the Luzon Strait and its effect on acoustic propagation. U.S. Nav. Postgrad. Sch., Monterey, Calif. AD# C022774L.
- Wallace, G.T. and J.O. Blanton. 1985. Estimated apparent cross-front eddy diffusivities based on suspended aluminum distributions. In D.A. Wisenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean. Res. and Dev. Act. NSTL, Miss.
- Wang, D.-P. 1982. Development of a three-dimensional, limited-area (island) shelf circulation model. *J. Phys. Oceanogr.* 12: 605-617.
- Wang, D.-P. 1984. Mutual intrusion and density front. *J. Phys. Oceanogr.* In press.
- Wang, D.-P. and C.N.K. Mooers. 1977. Evidence for interior dissipation and mixing during a coastal upwelling event off Oregon. *J. Mar. Res.* 35: 697-713.

- Watson, N.R. 1970. Measurement of thermocline fronts from the air. *Underwater Sci. Tech.* 2: 90-99.
- Watts, D.R. and W.E. Johns. 1982. Gulf Stream meanders: Observations on propagation and growth. *J. Geophys. Res.* 87: 9467-9476.
- Weinberg, N.L. and J.G. Clark. 1980. Horizontal acoustic refraction through ocean mesoscale eddies and fronts. *J. Acoust. Soc. Am.* 68: 703-705.
- Welander, P. 1963. Steady plane fronts in a rotating fluid. *Tellus* 15: 33-43.
- Welander, P. 1968. Theoretical forms for vertical exchange coefficients in a stratified fluid with application to lakes and seas. *Acta R. Soc. Sci. Litt. Gothob. (Geophys.)* 1: 1-26.
- Welander, P. 1981. Mixed layers and fronts in simple ocean circulation models. *J. Phys. Oceanogr.* 11: 148-152.
- White, W.B., K. Hasunuma and H. Solomon. 1978. Large-scale seasonal and secular variability of the subtropical front in the western North Pacific from 1954 to 1974. *J. Geophys. Res.* 83: 4531-4544.
- Whitehead, J.A., Jr. 1981. Laboratory models of circulation in shallow seas. *Phil. Trans. R. Soc. Lond. A302*: 583-595.
- Whitehead, J.A., Jr. 1983. Final technical report on contract N00014-81-C-0010, 1 October 1980-30 September 1982. Tech. Rep. Woods Hole Oceanogr. Inst. NTIS No. AD-A126 396/1.
- Whitworth, T., III. 1980. Zonation and geostrophic flow of the Antarctic circumpolar current at Drake Passage. *Deep-Sea Res.* 27: 497-507.
- Whitworth, T., III. 1983. Monitoring the transport of the Antarctic circumpolar current at Drake Passage. *J. Phys. Oceanogr.* 13: 2045-2057.
- Whitworth, T., III, W.D. Nowlin, Jr. and S.J. Worley. 1982. The net transport of the Antarctic circumpolar current through Drake Passage. *J. Phys. Oceanogr.* 12: 960-971.
- Wilkniss, P.E., E.B. Rodgers, J.W. Swinnerton, R.E. Larson and R.A. Lamontagne. 1979. Trace gas concentrations, intertropical convergence, atmospheric fronts, and ocean currents in the tropical Pacific. *J. Geophys. Res.* 84: 7023-7033.
- Willebrand, J. and J. Meincke. 1980. Statistical analysis of fluctuations in the Iceland-Scotland frontal zone. *Deep-Sea Res.* 27: 1047-1066.
- Williams, A.J. 1981. Role of double diffusion in a Gulf Stream frontal intrusion. *J. Geophys. Res.* 86: 1917-1928.
- Wiseman, W.J., Jr., R.E. Turner and F.J. Kelly. 1985. Chemical variability within the Louisiana coastal boundary layer: Spring 1982. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.



- Wiseman, W.J., Jr., L.D. Wright, L.J. Rouse and J.M. Coleman. 1982. Periodic phenomena at the mouth of the Mississippi River. *Contrib. Mar. Sci.* 00: 11-32.
- Wolff, P.M., L.I. Carstensen and T. Laevastu. 1965. Analysis and forecasting of sea surface temperature. *Fleet Num. Weather Facil. Tech. Note* 8.
- Woods, J.D. 1972. The structure of fronts in the seasonal thermocline. *SACLANTCEN Conf. Proc. M*: 144-151.
- Woods, J.D. 1974. Diffusion due to fronts in the rotation sub-range of turbulence in the seasonal thermocline. *La Houille Blanche* 7/8: 589-598.
- Woods, J.D. 1977. Parameterization of unresolved motions, p. 118-140. In E.B. Kraus [ed.], *Modelling and prediction of the upper layers of the ocean*. Pergamon Mar. Ser. vol. 1. Pergamon.
- Woods, J.D. 1980. Do waves limit turbulent diffusion in the ocean? *Nature* 288: 219-225.
- Woods, J.D. and N.R. Watson. 1970. Measurement of thermocline fronts from the air. *Underwater Sci. Technol.* 2: 90-99.
- Wooster, W.S. 1969. Equatorial front between Peru and Galapagos. *Deep-Sea Res.* 16: 407-419.
- Wright, L.D. and J.M. Coleman. 1971. Effluent expansion and interfacial mixing in the presence of a salt wedge, Mississippi River Delta. *J. Geophys. Res.* 76: 8649-8661.
- Wright, W.R. 1976. The limits of shelf water south of Cape Cod, 1941 to 1972. *J. Mar. Res.* 34: 1-14.
- Wyatt, T. 1975. The limitations of physical models for red tides, p. 81-93. In Locicero, V.R. [ed.], *Proc. 1st Int. Conf. Toxic Dinoflagellate Blooms*. Mass. Sci. Tech. Found.
- Yamagata, T. 1980. A theory for propagation of an oceanic warm front with application to Sagami Bay. *Tellus* 32: 73-76.
- Yamagata, T., S. Umatani, N. Masunaga and T. Matsuura. 1985. Observations of an intrusion of a warmer and less saline water mass into a bay. *Cont. Shelf Res.* (in press).
- Yamamoto, T., A. Taniguchi and S. Nishizawa. 1981. Microplankton distribution at an oceanic front formed in the Sanriku Waters off northeast Japan. *Bull. Plankton Soc. Japan* 28: 111-120.
- Yanagi, T. 1980. A coastal front in the Sea of Iyo. *Nippon Kaiyo Gakkai-Shi* 35: 253-260.
- Yasui, M. 1961. Internal waves in the open ocean (an example of internal waves progressing along the oceanic frontal zone). *Oceanogr. Mag.* 12: 157-183.

- Yentsch, C.M., P.M. Holligan and W.M. Balch. 1983. The significance of tidal mixing and bloom dynamics in the western Gulf of Maine. *Estuaries* 6: 322.
- Yentsch, C.S. 1985. One dimensional models for predicting nutrient and plankton productivity in ocean fronts. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Yoder, J.A., L.P. Atkinson, S.S. Bishop, E.E. Hofmann and T.N. Lee. 1983. Effect of upwelling on phytoplankton productivity of the outer southeastern United States continental shelf. *Cont. Shelf Res.* 1: 385-404.
- Yoder, J.A., L.P. Atkinson, T.N. Lee, H.H. Kim and C.R. McClain. 1981. Role of Gulf Stream frontal eddies in forming phytoplankton patches on the outer southeastern shelf. *Limnol. Oceanogr.* 26: 1103-1110.
- Yoder, J.A., L.P. Atkinson and T. Paluszkiwicz. 1985. Variability in primary production in response to disturbances of the loop current and Gulf Stream fronts. In D.A. Wiesenburg and D.R. Kester [eds.], *Chemical variability in ocean frontal areas -- workshop results*. NORDA Rep. 78. Nav. Ocean Res. and Dev. Act. NSTL, Miss.
- Zaneveld, J.R.V., M. Andrade and G.F. Beardsley, Jr. 1969. Measurements of optical properties at an oceanic front observed near the Galapagos Islands. *J. Geophys. Res.* 74: 5540-5541.
- Zaneveld, J.R.V. and H.J. Pak. 1979. Optical and particulate properties at oceanic fronts. *J. Geophys. Res.* 84: 7781-7790.
- Zeldis, J.R. and J.B. Jillett. 1982. Aggregation of pelagic *Munida gregaria* (Fabricius) (Decapoda, Anomura) by coastal fronts and internal waves. *J. Plankton Res.* 4: 839-858.
- Zheng, Q.A. and V. Klemas. 1982. Determination of winter temperature patterns, fronts, and surface currents in the Yellow Sea and East China Sea from satellite imagery. *Remote Sens. Environ.* 12: 201-218.
- Zheng, Q.A. and V. Klemas. 1984. Dynamics of the slope water off New England and its influence on the Gulf Stream as inferred from satellite IR data. *Remote Sens. Environ.* 15: 135-153.

U219203

NO FORM